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EDITED BY

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THE PRACTITIONER.

JANUARY, 1879.

Original Communications.

NOTE ON A METHOD OF ADMINISTERING CHLORAL HYDRATE.

BY E. L. DIXON, M.D., M.R.C.P.

On the 27th of July I was sent for some distance into the country to see a farmer, who was said to be dying. When I arrived I found that he had been suffering for the past twelve hours from a series of violent epileptic paroxysms, and that for three hours he had not been sensible. In my presence he had two attacks with an interval of twenty minutes, in which he never became quite conscious, but continued to toss about violently. He had passed urine involuntarily during a paroxysm; the pulse was quick and weak; the bowels had been well acted upon, and the temperature was high, 103°·2, as is the case in the status epilepticus. He had been, it was said, fairly temperate of late, but he had been thoroughly wet through two days before this attack. He was a robust man of twenty-eight years of age. Epilepsy had first shown itself about two years before, from exposure to the sun during hay-making, it was said, and the attacks had been repeated about every month till January last, when I was called in to see him on account of his having had several in one day. I then found he had been indulging freely in alcoholic liquors; the urine was free from albumen and of fair sp. gr., but nothing else was to be made out. I recommended strict teetotalism, and that he should take the bromide potassium regularly for some time. After this he had no return until about five weeks ago, when he had two attacks, and had then remained free till I was again sent for.

On this occasion, in consequence of the increasing rapidity of the recurrence of the fits, I became alarmed as to the result, for it was evident that unless they ceased he would become comatose and die. The principal indication seemed to me to diminish if possible the excitability of the reflex nervous centres. I did not venture, nor did I think it desirable to bleed him. I had no chloroform with me, but I had a small bottle of the liquor chloral hydrat. (Corbyn), of which each minim equals a grain of the salt. I tried to make him swallow a draught containing a drachm, diluted with water, but he pushed it away forcibly. I had also no syringe with which to administer it as an enema, or even hypodermically. With the assistance of a strong man, who held his head and opened the jaws with a piece of wood, I emptied a teaspoonful of the concentrated solution into the back of his mouth. He started violently, but did not eject any of the medicine. After a time I noticed that the restlessness diminished; still he did not sleep. About half-an-hour after the first dose I administered a second of about forty minims in a similar manner, when he gradually sank into a profound sleep, which lasted five or six hours, and there was no return of the convulsions. Next day I found his temperature had fallen to 101°·3, the pulse was quiet; the urine, however, contained a small amount of albumen, and was of sp. gr. 1·014.

ON ACUTE BRONCHITIS.

BY D. J. HAMILTON, M.B., F.R.C.S. ED., L.R.C.P. ED.,

Demonstrator of Pathology, University of Edinburgh, Pathologist to the Edinburgh Royal Infirmary.

The catarrhal affections of the bronchi are so familiar to everyone, from their common occurrence, that a knowledge of what takes place in the structures affected, how their mechanism is injured, and why it is that recovery is often so tedious and very frequently incomplete, becomes a matter of the greatest interest and importance to the practising physician. There is perhaps no class of diseases that one is more called upon to treat than that of the catarrhal affections of mucous membranes generally, and, curiously enough, there is perhaps no class of lesions whose pathology we know less about. There are almost no detailed researches as to what takes place in such mucous membranes and we have, consequently, no means of knowing accurately whether we have to do with an exalted normal secretion, an abnormal secretion, an affection of the mucous glands, or a lesion of the mucous surface itself. Where does the catarrhal secretion come from? What is it made up of? And why does the catarrhal inflammation in some cases tend to pass off and allow the mucous membrane to resume its healthy function, while in others, and these too commonly, it assumes a chronic form in which there is the greatest difficulty in bringing about a favourable result? These are the practical questions which we shall have before us in the present inquiry, and the object of what follows will be to show what structures are more particularly involved, how it is that recovery takes place, and why in chronic cases recovery is so protracted and frequently incomplete.

As in the study of any morbid process, we find that the primary departure from the normal to that which we understand as a diseased state is merely a matter of degree, either an exaggeration of, or a deficiency in, the normal standard, it is imperative before investigating what we call morbid processes, to become familiar with the natural histological structure and histogenesis of the part concerned. Disease is merely a departure from what we find to be the average normal condition, and before we can interpret what the disease signifies we must be thoroughly conversant with the means by which the organ or tissue is formed, grows, and has its waste elements repaired. The key to the elucidation of a diseased state is to be found in the observation of what occurs in the discharge of the natural functions of the part.

It will, therefore, be necessary before entering upon the subject of this paper to consider somewhat carefully the structure of the parts that we shall have to deal with, and, along with this, the manner in which their different textural constituents are reproduced; and as it is particularly with the *mucous membrane* of the bronchi that we shall have to do, our observations will, in the first place, be directed to its structure with more especial regard to its epithelial covering. Strange as it may appear, we know comparatively little of how laminated epithelial tissues generally are reproduced. They are constantly being shed, and although we may conjecture that the deeper layers give rise to the more superficial, yet the manner in which this is accomplished, and the source of the deepest layer of all, are still not clearly demonstrated. It is evident that, unless we understand this we can never appreciate any morbid overgrowth, or degeneration to which they are liable, and we shall see that the study of the whole subject of the catarrhal affections of mucous membranes is founded on this previously acquired knowledge. Why it should happen again that the bronchi and alveoli in the same lung are lined with totally different epithelium, is also matter for consideration. Both are formed from the same germinal layer in the embryo, so that the fact of the one being columnar and the other squamous, cannot rest on their primary source of origin. It is clearly an afterwork, suitable for the different purposes which the epithelial covering has to subserve in the economy of the part which it protects. Keeping in mind, however, that they were originally both derived from the hypoblast, we may better perceive how in reality there is not so very wide a difference between them as might at first sight appear, the one being perhaps a further development of the other.

STRUCTURE OF THE NORMAL BRONCHI AND THEIR SURROUNDINGS IN MAN.

After the trachea divides into its two primary branches, the latter very soon subdivide dichotomously until the ultimate bronchioles are reached, which, finally, open into the infundibula and air-vesicles. If one of these larger bronchi be laid open in a healthy person who has been suddenly killed, the mucous membrane which lines it is seen to have a pinkish colour, and is covered by a coating of frothy mucus. When this mucus is detached, the underlying epithelial surface is seen to be glossy and of a fine velvet-like consistence. It is comparatively transparent, so that in certain places, where it is thin, the underlying inner fibrous coat may be seen shining through it. If such a bronchus be cut transversely, it is found to be made up of at least three coats, probably a fourth, the innermost being the mucosa itself, the intermediate one being the muscularis, and the outer one the adventitious or outer fibrous coat containing the elliptical cartilages.

The Mucosa.—In the middle-sized bronchi it is thrown into longitudinal folds, but in the smaller and smallest it forms a smooth bordered membrane covered by epithelium (Fig. 1, *a*). It can be further subdivided into three layers, comprising the inner fibrous coat lying next to the muscularis, a basement membrane covering and attached to this, and an epithelial covering superficial to all. We shall examine the epithelial covering first. On careful examination with a magnifying power of about 480 diameters it can be easily recognised that the character of the cells in the epithelial layer is by no means the same at different depths, but that while the superficial cells have a columnar shape, those underlying them are transitional in character (Fig. 2); while deeper than this still we shall see that there is a perfectly flat layer lying on a homogeneous basement membrane, more like the endothelial cells seen on serous surfaces. A general view of the structure of a small bronchus is given in Fig. 2, where the stratified character of the epithelium will also be noticed. The broad end of each columnar cell has a fringe of cilia attached to it, and these usually bear on their surface a little viscid mucus (Fig. 2, *a*). Each of them has a nucleus, but the surrounding body of the cell is frequently so granular that this may be hidden from view. The underlying attachments of the columnar cells can be most easily studied in bronchi which have been the subject of acute congestion for from ten to twenty hours. The effect of the congestion is to cause a partial desquamation of the epithelium, so that the cells become isolated from one another, and, if such a bronchus be hardened in dilute solution of chromic acid, and the mucous surface either simply scraped or fine sections made from it and examined in water, the underlying attach-

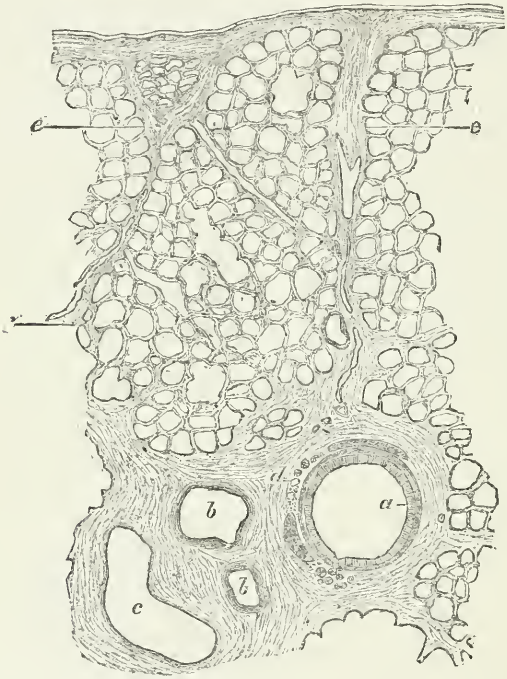


FIG. 1.—Section of normal human lung—× 50 Diams. (reduced ¼).

ments of the columnar cells, which otherwise are usually torn across, may be readily studied. It can then be noticed that the columnar cell does not end in a free tapering extremity, but has attached to it one of the rounded or somewhat flattened cells of the deeper stratum. This is best seen where the columnar cell is young and where its underlying attachment is thicker and not so easily broken as when it becomes older and more attenuated (Fig. 3, *a*). Letzerich has figured this appearance (*Virchow's Archiv*, vol. liii. p. 493), but believes that the underlying more flattened cell is a connective tissue corpuscle. That this is probably incorrect will be seen from the sequel, but it is apparent that what is represented in his figure is the above

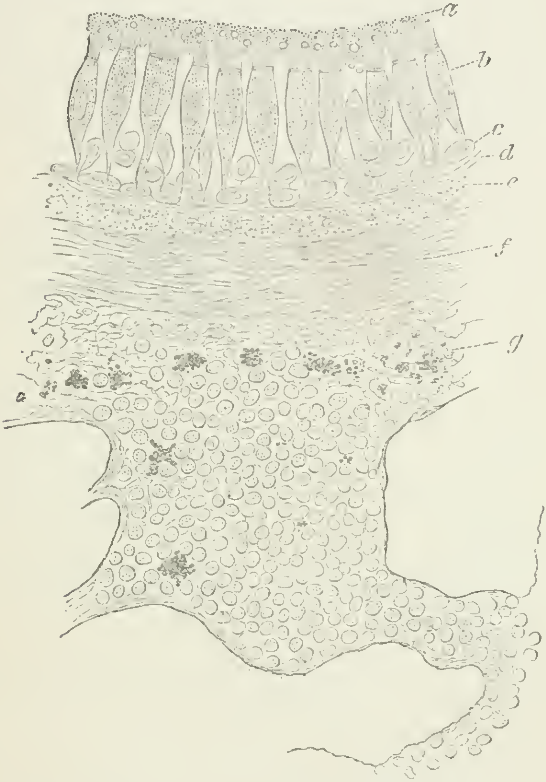


Fig. 2.—Section of normal human bronchus—× 480 Diams.

described attachment of a columnar cell to one of a different character underlying it.

Beneath the stratum of columnar cells there are several layers of a totally different character. The lowest of these when looked at from above seems to be quite flat and to correspond very much to what Debove (*Comptes Rendus,* 1872; *Archives de Physiologie,* 1874) has described as an endothelium underlying the epithelium proper in the trachea, bladder, and intestine. That such an endothelium exists, quite apart from the epithelium, and underlying it, made up of cells which are quite flat and usually hexagonal in shape, we have seen in the lower part of the trachea and larger bronchi. In Fig. 4 is represented a portion of the lower part of the trachea of a rat from which the columnar cells had been partially removed by pencilling with a camel's-hair brush, and then stained with nitrate of silver. At the upper part of the figure is seen the surface of the columnar cells as they appear when silvered with a magnifying power of 480 diameters. Their outlines are comparatively small, and the openings of chalice cells can be noticed here and there. At the lower part of the figure, however, the superficial columnar epithelium has been brushed off, bringing into view a totally different layer. It will be seen that the cells in this are much larger and usually six-sided, differing slightly in size, some of them being smaller

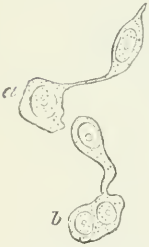


FIG. 3.—Cells from deepest and middle layers of bronchial epithelium—× 480 Diams.

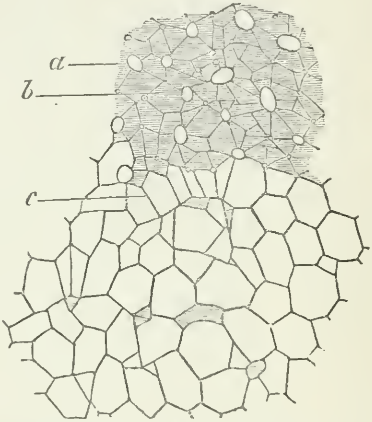


FIG. 4.—Surface view of bronchial epithelium stained with silver—× 480 Diams.

and evidently younger than the others. They appear to be quite flat when looked at from above, but when viewed on perpendicular section of the mucous membrane are seen to have a nucleus in the centre which gives them a more oval shape (Fig. 2, *c*). In Fig. 5 is seen this layer scraped off from the mucosa after pencilling in a chromic acid preparation from man. It is clearly made up of a pavement-like layer of extremely delicate cells, some of them, in a state of germination, having apparently fallen out. On perpendicular section also of the mucous membrane, especially where there is commencing catarrh, we can see this flat layer lying immediately in contact with the basement membrane to be afterwards described, (Fig. 2), so that there seems little doubt that it forms the deepest stratum of the epithelial investment. It has been suggested by Debove (*loc. cit.*) that this squamous layer is the analogue of the somewhat similar flat endothelial-like covering of the pulmonary alveoli, and certainly both its appearance in the normal bronchus and its behaviour under inflammatory stimulation would lend very considerable support to this theory.

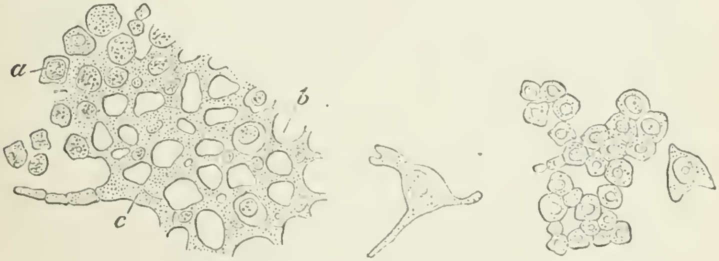


FIG. 5. FIG. 6. FIG. 7.

Cells from deepest layers of bronchial epithelium— × 480 Diams.

Between this flat layer of epithelium and the columnar cells on the surface there is an intermediate stratum composed of different shaped cells, in form more or less transitional between the deepest flat layer and the most superficial columnar. They are usually rounded in shape, and each cell is united to its neighbour by a slightly branching periplast, so that if individual cells be detached and looked at from above they frequently have an irregular contour from the fact that several processes come off from them which had previously served to unite the mass into a continuous stratum (Figs. 6, 7, 8). All these cells in this intermediate stratum are in a state of active germination, each cell usually containing two, three, or four nuclei, and each nucleus a vacuolar nucleolus. In the act of germination the nucleus elongates, becomes dumb-bell shaped, then entirely divides into two, and this in a short time is accompanied by a similar division of the body of the cell. On looking at this layer, however, more carefully on perpendicular section, as in Fig. 2, certain cells of a different character are to be seen. They are pyriform or "battle-dore" shaped, and have their tapering extremities implanted among the rounded cells just noticed, while the blunted end of the cell extends upwards between the ordinary columnar epithelium (Fig. 2). They have the same granular appearance and large nucleus and vacuole of the more rounded cells in which they are implanted, and they differ materially in size, some of them looking like small buds (Fig. 3, *b*) others being longer and forming bodies like those delineated in Figs. 9 and 10, *a*. The blunted round extremity which they usually possess is not invariably present, for it is sometimes noticed that the broad part of the cell has become constricted in the middle (Fig. 10, *b*), and has developed a nucleus in each segment. The constriction apparently deepens more and more, until a complete line of separation has taken place, and then the free portion becoming rounded is extruded between the columnar cells and thrown off on the surface as a *mucus corpuscle*. Further, in some rare cases where the cell is young, it presents the appearance seen in Fig. 11, where the part of the cell nearest the end of attachment is broad, while that in front of it is prolonged into a sharper point, and, frequently, as in the figure, several processes come off from it and serve to form an attachment to the more rounded

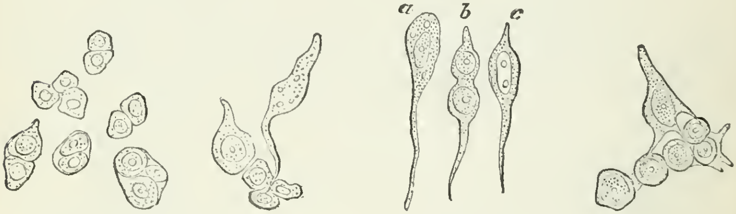


Fig. 8. Fig. 9. Fig. 10. Fig. 11.

Different transitional stages in the formation of columnar epithelium—× 480 Diams.

underlying cells. On scraping off some of these pyriform cells and preparing them specially with a view to isolation, it could be observed how their attached extremity ended. In no case did it seem to be a free process, but, where it was not accidentally detached, it appeared to grow or sprout from one of the more rounded cells underlying it. It looked very much as if one of the large rounded cells above described had divided into two, and one of the divided portions had sprouted upwards to form one of these more pyriform-shaped bodies. We shall see that these pyriform cells undergo further transformations, and become converted ultimately into the true columnar epithelium; but the manner in which this is accomplished will be better described in the part which treats of the reproduction of the desquamated epithelial covering.

It is, therefore, clear that in the epithelial lining of a bronchus we have not only a layer of columnar cells, but that there are distinctly seen at least two strata of a totally different character underlying this, the intermediate stratum being composed of cells of transitional shape, while deepest of all there is a layer of flat cells of a more endothelial nature. The pointed attached extremities of the columnar cells, especially in such as are of recent formation, run downwards to be implanted in this transitional stratum, and are connected with actively dividing cells contained within it; and it will afterwards be seen that a knowledge of this relationship and the fact of there being a deep stratum of actively germinating cells below those of a columnar shape, are most important preliminaries in the elucidation of the changes produced in acute and chronic bronchitis.

When the smallest bronchi are reached, immediately before they enter into the infundibula and air-vesicles, these stratified layers of epithelium are lost, and a single somewhat cubical covering is substituted, and, finally, on entering the air-vesicles the cells become very much flattened out and extremely delicate in contour, resembling in every respect the endothelium of a serous surface. It would therefore appear as if the structural type of the epithelium covering the whole of the air-passages, from the trachea downwards, was flat, and that the occurrence of the columnar cells in the bronchi is merely an accessory to the underlying more squamous layer.

The next point to which we have directed especial attention in this investigation is the question as to what the epithelial covering of the bronchial mucous membrane rests upon. Does it lie free on the inner elastic coat, or is there something interposed between them? This is by no means an easy question to answer, and no very definite reply has ever been made to it. It is only after the most careful investigation that we have arrived at the following results:—In Fig. 12 is represented a detached portion of the mucous membrane of a bronchus in man, looked at from above, which has been slightly squeezed out by the pressure of a cover-glass. The columnar cells (*a*) are seen flattened out and having their tapering extremities implanted in the germinal layer (*b*); while deeper than this still are seen the elastic fibres of the inner fibrous coat shining through. Looked at in this manner it would appear as if there were nothing intervening between the deeper layers of epithelial cells and the underlying elastic fibres. When, however, a section is made perpendicular to the surface of the bronchial mucous membrane, there is always seen *in man*, more especially in the larger bronchi, a perfectly homogeneous boundary layer (Fig. 2, *d*), having a wavy free border, staining of a pinkish colour with carmine, possessed, apparently, of no fibrous or cellular structure, and not acted on by strong acetic acid.

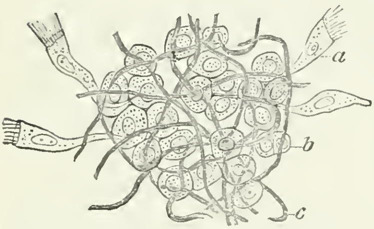


Fig. 12.—Surface view of bronchial mucous membrane—× 480 Diams.

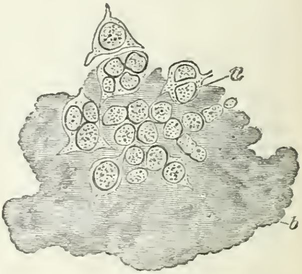


Fig. 13.—Basement membrane and attached epithelial cells of a bronchus—× 480 Diams.

Silver staining, so far as we have seen, fails to bring out any further structure in this membrane; and other re-agents, such as perosmic acid, likewise fail to develope anything further in it than a perfectly homogeneous translucent substance. In order, if possible, to detach this homogeneous basement membrane from its underlying attachments, we spread out a bronchus as flatly as possible on a piece of cork, and fixing it in this position, cut it layer by layer from the surface downwards in the freezing microtome. The first section removed was made up of the epithelium, but at the second section a layer was detached having the appearance seen in Fig. 13. A group of germinating epithelial cells is seen at one part (*a*), clearly showing that we had got down to the deeper part of the epithelial covering, while underlying this is a perfectly homogeneous membrane thrown into wavy folds (*b*). A few elastic fibres of the inner fibrous coat were seen underlying this, but they are omitted to prevent complicating the diagram. It appeared quite hyaline, and no endothelial markings or nuclei were visible upon it, a few granules, here and there, being the only interruption to its invariable homogeneous translucency. It reminded one very much of the structureless appearance of the matrix of hyaline cartilage, and, in other respects, it seemed to be a membrane acting a merely mechanical part in giving attachment to the epithelial covering, and separating it from the underlying vessels and elastic fibres of the inner fibrous coat. We shall see that it comes to be a most important structure in imparting the superficial character to the catarrhal affections of the bronchi; and, further, we shall find that as it becomes œdematous in such lesions, its structure and connections can be very much better made out.

The inner fibrous coat (Fig. 2, *c*) follows next in order, and it is this which gives to the deeper part of the mucous membrane its fibrous character. It is mainly composed of elastic fibres with a few bundles of colourless wavy fibrous tissue, and it is abundantly supplied with branches from the bronchial artery, which form a ramifying plexus immediately under and projecting into the basement membrane just described. It also contains many branched connective tissue nuclei, similar to those seen in the periarterial fibrous tissue of the pulmonary artery. These evidently lie in loose plasma spaces between the bundles of fibrous tissue, and the surface of the latter seems to be covered by an endothelium, whose nuclei are seen as large oval and extremely granular-looking bodies. The lymphatic system of the inner fibrous coat can be seen by brushing off the epithelium and then silvering. It consists of a branching network of lymphatic vessels and capillaries inclosing strands of a rounded, oval or irregular shape, in which is seen a close plexus of irregularly-shaped plasma spaces. These latter undoubtedly form the radicles of the peri-bronchial lymphatic system, and they correspond, no doubt, with those seen in the walls of the pulmonary air-vesicles.

The muscularis (Fig. 2, *f*) is that coat which lies next to the inner fibrous layer, and, in some respects, may be said to belong more properly to the mucosa than to be reckoned as a separate investment. It is composed of widely interlacing bundles of non-striated muscular fibres between which numbers of lymphatic vessels and spaces are to be seen.

The outer fibrous coat or adventitia, is of very great importance in the investigation of the changes produced in acute and chronic bronchitis. Its structure is that of somewhat loosely disposed bundles of white fibrous tissue with intermingled elastic fibres, arranged concentrically to the lumen of the bronchus, and passing continuously into the adventitious coat which surrounds the wall of the larger branches of the pulmonary artery (Fig. 1). On tracing the connections of this adventitious fibrous layer outwards into the lung substance, a further most important relation can be noticed (Fig. 1). Every here and there, passing in from the deep layer of the pleura, coarse fibrous bands can be seen which separate the one pulmonary lobule from the other, and are consequently known as the lobular septa. When these are followed inwards, it is apparent (Fig. 1) that after giving off several branching processes, they ultimately become connected to the adventitious coat of the bronchi and large branches of the pulmonary artery; and, as they run in from all sides, more especially at the periphery of the lung, there can be seen on a transverse section of a bronchus, perhaps three, four, or more such processes coming off at different parts of the bronchial wall. In none of the mammalia which we have examined, are the adventitious coat and lobular septa so well developed as in man, and we shall see that this relation is a most important one in the formation of bronchiectatic cavities in old standing cases of bronchitis.

The bundles of fibres forming the adventitious coat of the bronchus and artery are covered by a layer of flat endothelial-like cells (Fig. 14) which, when seen on their surface, are of an oval shape, but on section, have a spindle shape, from the bulging of the nucleus in their centre. Spaces of considerable size intervene between these bundles of fibres in which branched connective tissue corpuscles are found (Fig. 15), and in which, in the human lung, carbon particles are invariably met with, filling them partially or completely. They seem to be the lymphatic spaces of the peri-bronchial tissue, and they are much smaller, although more numerous, than those well-defined peri-bronchial lymphatics seen in some of the lower animals, such as the cat. On tracing them by means of the carbon particles which they contain (and which form, as in the coal miner's lung, a natural injection of the lymphatic system) further outwards, they are found to have a free communication with those similar spaces which surround the pulmonary artery, and apparently pour their contents into them; while these, again, are continuous with lymphatic vessels of large size seen in the lobular septa. The lobular septa conduct them out to the deep layer of the pleura, where an abundant plexus of large lymphatics ramifies, and ultimately, no doubt, they pass by means of these to the bronchial glands at the base of the lung. The superficial layer

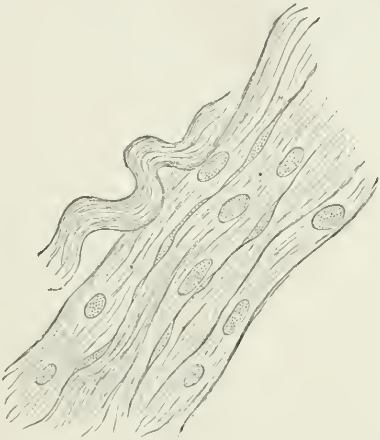
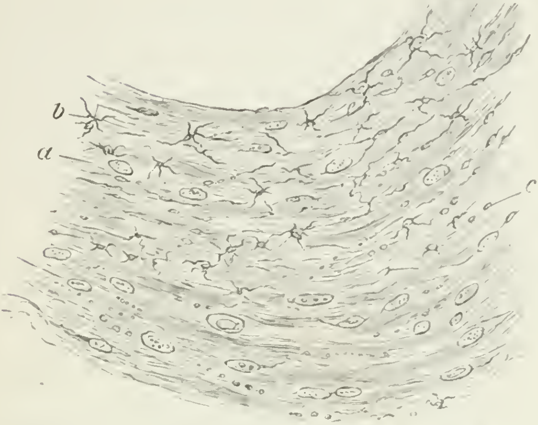


Fig. 14.—Peribronchial fibrous tissue— × 480 Diams.

of the pleura *never* becomes pigmented, the lymphatics in this representing those of the pleura proper, having, apparently, few or no communications with those of the deeper layer.

We shall notice these relations of the lymphatics in the human lung subsequently, but this introduction will be sufficient to aid in the description of the changes they undergo in acute bronchitis. The lymphatic glands, in the human lung, are continued along the bronchi to a considerable distance within the lung substance, and they are afterwards represented in the bronchioles by the peri-bronchial lymphadenoid deposits situated in the adventitia (Fig. 2). In man, these peri-bronchial lymphadenoid deposits have an indistinct reticular structure, and, apparently, lie on the side of a lymph path, as in the corresponding structures in the lower animals; for, almost invariably, inhaled carbon-particles can be seen passing in a row by the side of such a deposit, while some of them have become entangled within it (Fig. 2). While these peri-bronchial lymphatic deposits are occasionally met with, the corresponding peri-arterial formations, so well developed in the lung of most of the lower animals, are either absent in the healthy human lung, or are of quite a rudimentary character. In the cat, for instance, these peri-arterial deposits are made up of a distinct flat-meshed reticulum, with lymphoid cells contained in it (Fig. 16), very much the same as in a lymphatic gland, and have a distinct boundary line, apparently due to the distended peri-arterial fibrous tissue. In man, however, no such distinctly developed lymphatic gland-like bodies are to be seen around the arteries, and the bronchi only possess them here and there. In Fig. 2, *g*, one of these lymphadenoid deposits is seen in connection with a human bronchus. It is placed in the adventitious coat, and extends for some distance along the walls of the neighbouring pulmonary alveoli. There is no distinct reticulum visible, but this may be due to the mass of cellular structures comprised within it. We have never been able, however, to see the same flat-meshed reticular structure in these human peri-bronchial formations that can be observed in the corresponding peri-arterial structures in the lower animals; and it is evident that although the former are undoubtedly of the same nature, they are much less highly organized than those found in many other mammalian lungs.

The mucous glands are found in those bronchi which are provided with cartilages. They are racemose in character, and they run partly in the interspaces between the cartilages, and partly lie on the inner surface of these structures, where they



[Fig. 15.—Periarterial fibrous tissue—× 480 Diams.

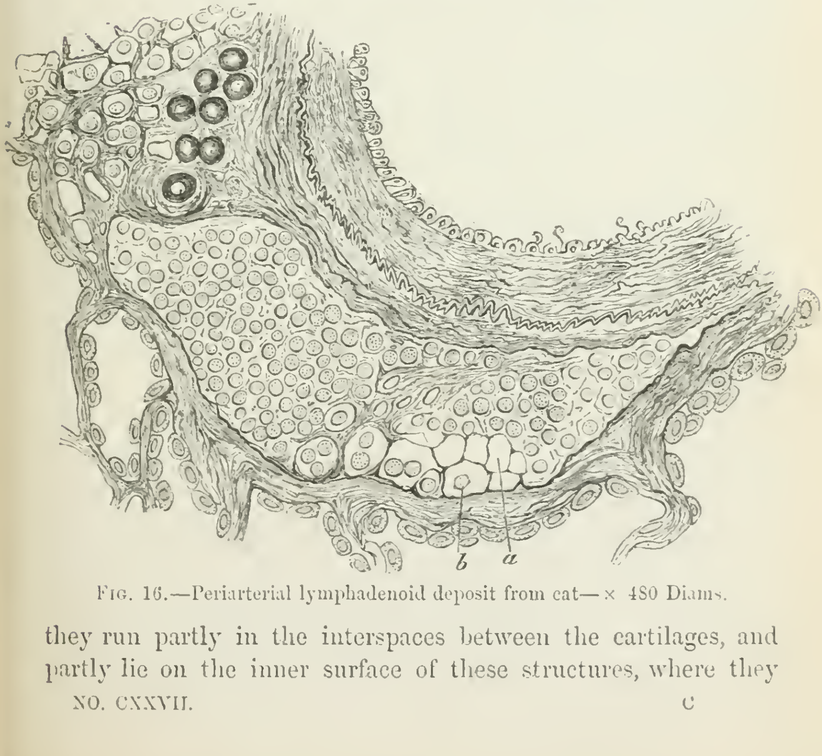


Fig. 16.—Periarterial lymphadenoid deposit from cat—× 480 Diams.

have a flattened appearance. They each have a duct which opens into the bronchus by a trumpet-shaped orifice (Fig. 1) while the neck of the gland becomes rapidly constricted. The epithelium lining the neck of the gland is a double layer, the superficial cells being columnar and ciliated, while those in the deeper stratum are more spheroidal or pavement-like. Near the termination of the duct of the gland the columnar cells become smaller in size, transitional in character, and finally disappear, the deeper germinal layer being continued into the alveoli of the gland. In this latter situation the majority of the cells are wedge-shaped or spheroidal in character; but underlying these there is a layer of flat endothelial-like cells best seen when the superficial cells are distended with mucus, and consequently rendered transparent. It seems to be similar to Debove's layer in the trachea and bronchi. The whole course of the duct is provided with a finely fibrous basement membrane, and between the ramifications of the gland there are numerous blood-vessels, with a well-marked stroma, and numerous connective-tissue plasma spaces.

THE REGENERATION OF THE EPITHELIAL COVERING IN THE NORMAL BRONCHI.

Having considered so far the minute structure of the normal bronchi, the next point for examination before we enter upon the consideration of the catarrhal affections of the mucous membrane, is how the epithelium, which is constantly being shed during health, is repaired; where the columnar cells come from, and how they are formed.

We have seen that in bronchi of large and medium size there may be said to be three varieties of epithelium arranged in so many superimposed strata, the whole of them resting on an apparently elastic structureless basement membrane. The layer which is next to the basement membrane, and consequently deepest in the series, is flat, and has more the character of an endothelium; that which succeeds it is of a transitional nature, while the most superficial is the layer of completely developed columnar cells. These different layers differ so much from each other, that one does not, at first sight, perceive how they can have any mutual relation. In bronchi from the human subject however, which have been slightly hardened in a weak solution of chromic acid, it can be seen that the one is merely a further advanced development of the other, that the deeper layers are merely, as it were, the "raw material" out of which the "imago" or perfect columnar cell arises. The study is best made in bronchi which have been the subject of acute congestion a few hours before death, the resulting œdema of the basement membrane serving to produce partial desquamation or loosening of the epithelium, and consequently to isolate the one cell from the other. The preparations are best made by scraping the mucous membrane gently and examining the detached cells simply in water, and then afterwards comparing the appearances procured in this manner with those exhibited on a perpendicular connected section of the mucosa.

In persons who have been killed by opium certain of the bronchi are specially favourable for this study. With very little care it can be noticed that the columnar cells do not usually end in free pointed extremities as represented in Fig. 16, but that, as mentioned before, they are attached to an underlying somewhat flatter often polygonal cell of the intermediate or transitional layer. There can be further seen lying between the columnar cells "battle-dore" or tadpole-shaped cells having a similar deeper attachment. Schulze has figured them in his article on the lung in Stricker's histology, but he does not appear to have recognised their significance in relation to the underlying layer of germinating cells. If a portion of the intermediate transitional layer be detached, small pyriform offshoots can be seen sprouting from it (Figs. 3 and 9), of the same shape as those bodies just referred to between the columnar cells, but smaller in size, while the cells in the transitional layer itself are all seen to be in the most active state of germination.[1]

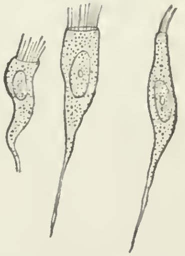


FIG. 17.—Partially and completely developed columnar cells.

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[1] The bodies represented by Klein in his classical work on the *Lymphatic System of the Lung* in Fig. ix. A and B, as pseudostomatous cells we believe to

Putting all these facts together, and after carefully studying the epithelial surface, both detached and *in situ*, we have arrived at the following conclusions as to the formation and repair of the columnar cells.

The transitional or germinating layer is that from which they are produced, and the first appreciable step in their formation is the division of one of the polygonal cells contained in it into two, four, or more, of smaller size (Figs. 7 and 8). The nucleus of the parent cell divides first, and this is followed by the fissiparous division of the body. Very soon, however, either while attached to the parent mass, or when removed to some distance from it, one of these elongates and becomes pyriform in shape, its broad end looking into the lumen of the bronchus, the other having a deeper attachment to the cells from which it originally sprung. It grows, gains in bulk, and developes a large oval nucleus with vesicular nucleolus (Fig. 3 *b*), and at times it is seen to have more than one delicate process of attachment to the underlying germinal mass (Fig. 11), the free extremity of the cell in such a case usually being the more pointed of the two, the other being somewhat blunted. All of these various processes are apparently lost at a later period, and then the cell assumes a pyriform shape, and it seems very probable that these, while the processes are still present, correspond with the pseudostomatous cells described by Klein in his work on the *Lymphatic System of the Lung.* This pyriform offshoot then stretches upwards between the columnar cells, and assumes a "battle-dore" or tadpole shape, and we think would then correspond to the bodies already referred to (p. 19) as figured by Schulze (*loc. cit.*). The next transformation is a very interesting one; the blunt end of the "battle-dore"-like cell elongates into a sharp point (Fig. 10 *c*), and then this proboscis-like point can be seen to become longitudinally striated (Fig. 17). The end of the cell then dilates, and the consequent splitting up of the striated

be merely transitional forms of columnar epithelium. They are much better seen in the human bronchus than in that of the guinea-pig from which his figure is taken, although essentially the same structures are to be found in the bronchial epithelium of all the mammalia that we have examined. The interepithelial bodies represented at B (*loc. cit.*) we would look upon as young epithelia, with the processes which are so often found in connection with them. The above-mentioned figure (ix. B) is surely somewhat diagrammatic, probably caused by the surroundings having been omitted.

extremity gives rise to the cilia of the fully developed columnar cell (Fig. 16). It can now be seen what the importance of the transitional layer is, and why the cells found in it are always in an active state of germination. A further question comes to be, what the relation is between the transitional cells and Debove's flat layer. It seems to be that the germination which goes on in this flat-cell layer furnishes young germinal cells which are partly thrown off, and partly supply a certain number of those found in the transitional or middle stratum. The whole process of formation of the columnar cells seems quite rational when looked at in this way, for when we consider the common origin of the whole epithelium of the air-passages, we can see how the flat cell is the original type, and how the columnar cell must be looked upon merely as in a further advanced stage of development. Even although the epithelium of the air vesicles seems so different from that of the larger bronchi, it only requires slight stimulation, as in acute catarrhal pneumonia, for it to undergo division and germination. And if we look at such a surface a short time after the inflammatory excitation has commenced, the same pyriform or "battle-dore"-like processes will be seen to be given off from the proliferating cells, identical with those seen in the deeper layers of the bronchial epithelial covering. With a very slight further advance it can easily be conceived how the development of a perfect columnar cell might be arrived at; and were this irritation continued for a lengthened period it can be understood how a certain impression might be made on the endothelial surface, resulting, in the course of time, in a permanent developmental peculiarity.

One thing remains to be noticed at this stage of our inquiry, namely, the origin of the mucous corpuscles. In normal mucus they are seen to be round bodies, differing somewhat in size, but usually about that of a leucocyte; and, when a section is made perpendicularly through the mucous membrane, they are seen lying on the surface of the cilia imbedded in stringy mucus. On careful examination of the epithelial surface round or stretched-out cells of a similar nature can occasionally be seen, making their way between the columnar cells, and finally emerging on the free surface. They arise from the deeper layers, and are frequently formed in the manner shown in Fig. 10 *b*, where one of the pyriform cells from the deeper layer is seen becoming constricted in the middle, and a nucleus forming in each portion. By a further contraction complete separation of the two occurs, the peripheral segment making its way outwards, as a mucous corpuscle. We would look upon the mucous corpuscles, then, simply as the waste products of the germinal or formative layer of epithelium, which have not gone on to complete development, but which have been thrown off in an unfinished condition. There seems every reason to believe, and indeed it can be shown beyond doubt, that the same thing occurs in the mucous glands themselves, but that they are the exclusive source of the mucous corpuscles is certainly very far from the truth. The function of the mucous glands seems to be in great part, if not entirely, that of the secretion of the fluid part of the mucus; and we shall see that in bronchitis this function is exalted to an extreme degree.

(*To be continued.*)

THE USE OF CITRATE OF CAFFEIN AS A DIURETIC IN CARDIAC DROPSY.

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CAFFEIN, ($C_8H_{10}N_4O_2$), which exists in the form of silky prisms soluble in about sixty parts of water, is a principle contained in coffee, tea, guarana, and other plants used in different countries to form stimulating or restorative beverages. In the form of a soluble citrate it has been used in doses of a grain in tic douloureux, hemicrania, and varied forms of neuralgia, but with doubtful success. Coffee in the form of strong decoction is further known in medicine as an astringent in certain forms of diarrhœa (Waring's *Manual of Therapeutics,* § 682), and here it probably acts on the theory of stimulating the vasomotor nerves and so relieving the atony and consequent hyperæmia of the mucous membrane, allaying such forms of diarrhœa as may be deemed atonic, colliquative, sympathetic, or vasoparalytic as in cases of extreme cachexia. In other countries coffee, in the form of infusion, is used as a febrifuge in fevers and as a nutritious tonic and stimulant in cases of adynamy. Liebig again points out that caffein is identical with theïn, the peculiar principle of tea, and both these substances he found with the addition of O and H, to be capable of yielding taurine, the nitrogenized principle of the bile. According to Binz (*Elements of Therapeutics*), caffein can be artificially prepared in the form of methyltheobromine, by replacing one atom of H in the alkaloid of the cocoa bean—theobromine ($C_7H_8N_4O_2$)—by the radicle methyl. These points in the therapeutic history of the drug are not without their own special interest and importance, but it is to Professor Gubler (*Le Progrès Méd.*) that we are indebted for drawing attention to the special property of the drug in the form of citrate or bromhydrate in doses of from iv. to viij. grains, as inducing abundant and instantaneous diuresis in cases of cardiac dropsy, either when given hypodermically or by the mouth. The object of this paper is to confirm this observation on the diuretic property of the citrate of caffein, and to seek for some physiological explanation of its use; but as the drug has a manifest tendency to induce nausea and vomiting, the dose has in each case recorded been limited to gr. iij. under which copious diuresis has generally been established even in the most advanced cases of cardiac dropsy.

Case I.—Wm. W., aged 45. Admitted into the Exeter Hospital, July 25, 1878. On admission there was urgent dyspnœa with the maintenance of the sitting posture; general anasarca, but specially of the lower extremities; slight ascites, and the quantity of urine passed per diem varying from a pint to a pint and a half, although free from albumen. Examination revealed an enfeebled jerking rapid pulse-stroke, a tumultuous irregular cardiac action, a systolic murmur conveyed to the axilla at the heart's apex, a diastolic at base, together with crepitation and slight dulness on percussion at the bases of both lungs—or the physical signs of mitral and aortic insufficiency with congestion of the lungs. This patient was at first placed on a mixture containing tinct. digitalis ♏x. and citrate of potash thrice daily; and somewhat experimentally at first, citrate of caffein gr. iij. in pill at night. The first night after taking the pill he had rest and repose, and the quantity of urine passed during the night and following morning amounted to two and a half pints. After the lapse of a few days, however, the quantity of urine began again to diminish and the heart's action became more tumultuous and irregular; the digitalis mixture was therefore omitted, and the citrate of caffein in gr. iij. doses was ordered in solution with glycerine and water thrice daily. The urine had risen in quantity the next day to two pints, and during the six weeks in which the citrate of caffein mixture was regularly continued, the urine varied in quantity from two to three pints in the twenty-four hours. My notes also record on September 2, "Heart's action more regular, less tumultuous, and comparatively more powerful." On September 9, "Heart's action regular, patient relieved and more comfortable, with a better appetite, and the state of general anasarca much lessened and rapidly disappearing." It may be said that under the use of the citrate of caffein the extreme urgency of symptoms under which the patient laboured, and which rendered the prognosis a grave one from the outset, passed away, and there was established a state of repose, and a temporary state of power, which the ordinary form of treatment by digitalis and diuretics failed apparently to produce. Considering, indeed, the existence of mitral and aortic insufficiency with a large dilated heart, undergoing progressive mural decay and an embarrassed neurosal muscular action, little more could perhaps be expected. The case eventually succumbed to superadded attacks of angina pectoris, congestion of the lungs, and rapidly recurring general anasarca, and the autopsy established the correctness of the primary diagnosis.

Case II.—Anne T., aged 47. Admitted into the Exeter Hospital, June 28, 1878. Bronchitis: brawny œdema (simulating elephantiasis) of legs with erysipelatous inflammation which had followed puncture, general anasarca, ascites, and considerable hepatic enlargement. Examination revealed mitral incompetency with a large dilated attenuated heart; a rapid, irregular adynamic, and inco-ordinate cardiac action, and a small rapid irregular pulse; the quantity of urine passed in the twenty-four hours amounted to one pint; it was acid, high coloured, but free from albumen. She is a stout woman with dusky complexion, and sits up in bed breathing hurriedly and in apparent distress.

The effect of digitalis combined with other diuretics in this case appeared to be to increase the quantity of urine passed to a slight extent, but otherwise an increase of the cardiac distress and an alarming retardation of the heart's action was induced—digitalis combined with stimulants produced no better results. A fortnight after admission, gr. iij. citrate of caffein was ordered in pill every night. On the first night the pill was taken she slept better, and towards morning passed what she herself described as a large quantity of urine, but owing to misunderstanding it was not measured. The next day the quantity passed in the twenty-four hours under the use of the caffein was four pints, and with these results before me the digitalis mixture was stopped and the caffein in pill ordered every four hours.

During the four weeks that the caffein was used the quantity of urine varied from three to four pints, and the practical results were, subsidence of all œdema and ascites, and even the legs assumed their normal size, the action of the heart became more forcible and regular, and the patient became so far convalescent as to be getting up daily. Latterly the caffein appeared to induce sickness, and it was therefore discontinued, and small doses of iron with digitalis were looked to to establish the work begun. There remained, however, a large dilated attenuated heart, showing every sign of muscular embarrassment, and an incompetent worthless mitral valve, together with a liver enlarged to below the umbilical line, and occasionally urgent dyspnœa, and some bronchitis. The case ultimately succumbed to a sudden attack of congestion of the lungs three months after admission, and during a time when progress appeared satisfactory. The autopsy verified the cardiac condition diagnosed.

Case III.—John L., aged 63. A thin, spare, ill-nourished man, with a systolic mitral murmur, and a feeble irregularly acting heart. The apex of the heart was displaced to the left, the pulmonary second sound was accentuated, and a soft blowing murmur accompanied the first sound in the tricuspid area. Urine scanty and albuminous ; lower limbs œdematous, pain and tenderness on pressure, and dulness on percussion in the epigastric region, for which he stated he had been sent into the hospital on the view that there was some disease of the liver. The case appeared to be one of mitral insufficiency, congested right side, and congested portal system, together with a heart commencing to undergo mural decay.

On the third day after admission the following mixture was ordered :—

℞ Caffein citratis gr. iij. Glycer. ʒss. T. Pruni virg. : ʒss. Aq. (ad) ℥j. ft. H. t. d. s. ;

and a pill of podophyllin and aloes every other night.

The day following the quantity of urine had risen from one pint to two and a half pints, and the subsequent daily account gives, (August 28) three pints, (29) three pints, (30) two and a half pints, (31) two pints.

The urine was now clear and contained no albumen. The heart's action was more forcible and regular, hepatic dulness, tenderness and pain had diminished, appetite was returning, and he expressed himself as considerably better than he had been for months. During the time that the caffein mixture was continued the urine varied in quantity from two to three pints in the twenty-four hours, and iron and digitalis was finally looked to to establish convalescence. The case was discharged relieved.

Case IV.—Elizabeth R., aged 56. Stout, but healthy in appearance. Complains of weakness, giddiness, and enlargement of the bowels, with puffiness of legs. She states that she has only been growing so stout within the last six months, and at the same time she noticed that shortness of breath on exertion and momentary attacks of giddiness affected her. Examination revealed an aortic systolic murmur, with the first sound relatively feeble at apex. The amount of urine passed in the twenty-four hours amounted to one pint, contained no albumen, but was loaded with lithates.

A mixture containing gr. iij. of citrate of caffein in solution with glycerine and water was ordered thrice daily. For the next two days the quantity of urine passed was doubled, and it became clear; sickness then supervening, the mixture was discontinued for one day; the urine fell again to one pint, but rose again to two pints under the following day's use of the caffein. Sickness recurring the caffein was then discontinued, and the case offers no other point of interest.

The four cases enumerated will probably suffice to illustrate the value of citrate of caffein as a safe and efficient diuretic. Cases I. and II., it will be observed, were urgent, and they were, moreover, cases in which digitalis and diuretics appeared, for reasons readily understood, to be of no avail. Case III. had no special urgency, but essentially the same pathological state was present; and Case IV. illustrates by itself the therapeutic position of the drug as a simple excitor of renal secretion; the remaining points indicated are, the tendency of the drug to excite sickness in some cases, and the general sedative effects it appears sometimes to induce. My observations also lead me to the opinion that citrate of caffein occupies a "special" place as a therapeutic agent in cardiac disorder, and this is of course dependent upon a clinical hypothesis of the physiological agencies whereby its remedial effects appear to be induced. This "special" position of the drug as a cardiac diuretic appears limited to advanced cases of cardiac disorder, or such advancing cases of cardiac disorder where muscular embarrassment and neurosal inco-ordinate cardiac action (the indicators of progressive mural decay) appear clinically to forbid the administration of "tonic" doses of digitalis so long as an outlet has not been effected from the venous system which shall, coincidently with more powerful cardiac contraction, relieve the stagnating pressure of venous blood on the right side of the heart. It is to (1) diuretics establishing a drain on the general circulation, and indirectly staying the congestion of the renal veins in their connection with the inferior vena cava; and (2) to drastic purgatives acting on the valveless portal circulation, and so directly unloading the stagnating venous system; that we usually look for performing the necessary function of establishing equilibrium in the cardiac and general circulation. If we can effect this by either or both of these means the heart at once gains power irrespective of tonics to excite its muscular action, because its source of embarrassment is removed, and the way is, so to speak, paved for the action of "tonics" as safe and efficient remedies. Now, according to Binz (*Elements of Therapeutics*), "Caffein in moderate doses increases the heart's action, both by its direct effect on the organ, and also by exciting contraction of the arteries. The blood-pressure and the frequency of the pulse are intensified. More urea and carbonic acid are excreted and urine secreted than in the normal state, but all these symptoms are of relatively short duration." In other words citrate of caffein is (1) a diuretic or excitor of renal secretion, and the establishment of this effect is of primary importance; and (2) it increases the heart's action either (*a*) directly by stimulating the organ itself, or (*b*) indirectly by means of the arteries which it also excites to further contraction. Both these latter effects, by which the heart is controlled, are of great interest and importance; it is clinically probable that the first effect, that of direct stimulation of the heart itself, is produced through the agency of the sympathetic system, and specially of the intrinsic cardiac ganglia, for it is in the early, progressing, and later stages of mural decay that the drug appears to exert its influence; in the early, when the direct stimulant will enforce greater contraction, and therefore stay the enfeebling compensatory power; in the later, when a state of adynamy and muscular embarrassment calls for an unloading of a stagnating circulation, and a stimulation of a muscle weakened from overwork. It is not always, indeed, that apparent increased cardiac action demands a sedative such as digitalis, aconite, or prunus virginiana: adynamic palpitation, which is really the result of inco-ordinate muscular action, or a want of associative action amongst the intrinsic cardiac sympathetic, will only be met by stimulants added to diuretics, that for the time promote blood-pressure and stimulate the renal organs to independent action. The intrinsic cardiac ganglia are physiologically of the utmost importance, for they endow the heart with an inherent power of its own, and enable us to account for the occurrence of palpitation when apparently other conditions are adverse to such increased movement: adynamy and arterial relaxation may exist, but yet there is palpitation of the heart; the pulse, moreover, is no criterion of the extent or state of its existence, and this because, in addition to the plexus of the great sympathetic with its connecting media to the spinal ganglia and cord, the heart exhibits in itself the excitory ganglia (specially of Remak and Bidder) stimulated by sensory centripetal fibres in the endocardium, and left uncontrolled by the inhibitory interauricular ganglion of Ludwig, which has been experimentally shown to be unable to counterbalance the motor power of its antagonists. Therapeutically, then, we want to relieve a stagnating circulation, and to stimulate the cardiac ganglia reflexly excited through pressure of blood on the endocardium to co-ordinate action. This double effect is induced by citrate of caffein.

Caffein, again, it has been said, excites the arterial vessels to contraction. Like belladonna it probably acts by overcoming the controlling effect of the splanchnic nerve, and through this medium, that of the abdominal vascular system generally, but whether this is induced directly on the vessels, or indirectly as a reflex act commencing in the sensory nerve (depressor nerve of Ludwig and Cyon) of the heart itself is practically not very material: suffice it to say that caffein similarly to belladonna appears to increase vascular pressure, and consequently promotes cardiac contraction through the medium of the splanchnic nerves.

Whatever may be the true theory of the action of citrate of caffein, the opinion is practically forced upon me through marked success in certain cases of the same type, and equally marked failure in other cases of a different type, that the caffein in doses of from gr. iij. to gr. vj., is a diuretic and cardiac stimulant of great value in such cases of cardiac dropsy where a dilated, feeble, and irregularly contracting heart undergoing progressive mural decay is the main clinical and pathological element to be contended against.

NOTE ON THE USE OF ERGOTIN IN A CASE OF UTERINE FIBROID.

BY J. CRAWFORD RENTON, M.B.,

Extra-Assistant Surgeon to the Western Infirmary, Glasgow.

May 1st.—To-day saw Mrs. L., æt. forty-five. Patient complains that for the last six months her menstrual periods have been increased in frequency, and the discharge doubled in amount; for the last three months she has hardly been free from the discharge, and at times it has poured from her, producing faintness. She also suffers from breathlessness on any exertion.

Her appearance justifies her statement, as she looks anæmic and the exertion of speaking tries her; she is a spare, thin, slightly-built woman. Her previous history shows that she has always had a copious discharge, and on one occasion after a miscarriage she suffered from severe hæmorrhage. Her children are healthy and her family history good.

Examination per Hypogastrium.—On pressure patient complains of slight tenderness in the left iliac region. No enlargement of the uterus can be felt.

Per Vaginam.—Cervix is found to be thrown forward towards the pelvis, and posteriorly Douglas' space is filled by a large mass of a dense consistence, which is slightly movable upwards. Os closed. Sound passes three inches. Heart sounds weak, and a loud anæmic bruit is heard over cardiac region. No signs of any pulmonary or other complication. Urine normal.

May 3rd.—Professor Leishman, to whom I am indebted for the above report of the pelvic conditions, saw patient along with me, and coincided with me in recommending rest in bed, good diet, and a trial of ergotin, either subcutaneously or by suppositories. He suggested in addition the introduction of a Hodge's pessary to give support and, if possible, to raise the tumour upwards and forwards.

May 4th.—Three grains of ergotin injected subcutaneously, but patient suffered so much pain in her arm after it that we had recourse to suppositories, four grains in each. At first she had two daily, but the discharge continued so profuse that we increased the dose to four, equal to 16 grains.

May 12th.—After having the above for four days, she suffered from severe headache and sickness, but the discharge diminished, and for the first time for three months she was free from the drain on her system. She was now ordered to have two suppositories daily, and this was continued for a week, and then only one was used until the 26th, when the discharge commenced again, but not in the severe manner it had done formerly.

May 28th.—As several clots came away to-day, the dose was doubled.

June 5th.—Discharge quite ceased.

June 12th.—Patient is steadily improving; has been allowed to rise and rest on a sofa. A tracing of her pulse at this period showed a very weak wave, and she was ordered Postans' citrate of iron and strychnine, with stoppage of ergotin.

June 16th.—Four grains of ergotin resumed at night.

June 30th.—Discharge commenced and continued in moderate degree for ten days.

She mentioned that she thought there was a difference in the colour of the discharge, and she asked if it were possible the medicine could be coming away in it.

She was requested to omit using a suppository for two nights, and to send a specimen of the menstrual fluid, as also of the urine, for examination. On being tested the former gave with potash a distinctly fishy odour, which was appreciated by other medical men who happened to be present (the odour was not due to putrefaction); it was again examined the following month, and the same odour felt. The urine gave no such reaction with potash.

October.—Patient continues to menstruate regularly, and her general health has so much improved that she is able to attend to her household duties with comfort. She still uses the ergotin for five days previous to a period.

We think we may fairly ascribe the improvement in this case to the ergotin, and if further observation confirms the presence of the drug in the discharge, it will go far to establish its affinity for the uterus.

THE TREATMENT OF ALCOHOLISM.

BY F. P. ATKINSON, M.D., ETC.

Kingston-on-Thames.

SOME of the most distressing cases we, as medical men, are called upon to attend are those of alcoholism, and it has, unfortunately, fallen to my lot during the last few years to have several from time to time under my charge. A good deal has been written by different persons with regard to treatment but I do not think this ought to deter one from putting on record his own personal observations, since it is only by accumulation of evidence that proper conclusions can be arrived at.

As far as I can see, there would appear to be three different stages in the disease, viz.:—

1. *Sleeplessness,* accompanied by a hard quick pulse; loss of appetite in the morning, and morning sickness.

2. *Drowsiness,* accompanied by a slow, somewhat compressible and excitable pulse; complete loss of appetite; and constant sickness. The blood has in it an excessive amount of hydrocarbon.

3. *Delirium,* accompanied by complete absence of sleep and the presence of horrible apparitions, especially at night. The pulse is small, quick, easily excitable and compressible. The blood is deficient in red corpuscles. Hydrocarbons are present in poisonous quantities; the brain undergoes little or no repair. The vaso-motor nerve influence is almost entirely lost.

The treatment I have found beneficial in each stage is the following.

First Stage. Træ Rhei ♏x.
Træ Card. Co. ʒss.
Træ Hyoscyami ʒss.
Acid Hydrocyanic dil ♏iij.
Sp. Chloroformi ♏xv.
Aquæ ad ℥i. quartis horis.

The prussic acid acts as a sedative to the stomach, heart, and brain. The hyoscyamus has also to a certain extent the same effect.

Abstinence from stimulants in this, as in the other stages, is strictly enjoined, but when I find it difficult to get this carried out, I allow a glass of claret 3 times a day. It is essential that the patient gets plenty of light and easily digestible food, and with this object I order Brand's essence of beef, milk and eggs beaten up together, and barley water. This diet is suitable to each stage. The only thing to be said is the more the depression the more the nourishment.

Second Stage.—The treatment should be the same as just described, only it is as well to omit the prussic acid, as there is not the same excitement present.

Third Stage.—Chloral should be given in 30-grain doses every 4 hours, till sleep comes on, and then repeated as often as necessary. The nourishment should be by no means forgotten, and stimulants should be strictly forbidden.

If chloral is gone on with beyond a certain time, a sleepless condition recurs, when nux vomica and gentian should be given as follows—

Træ Nucis Vomicæ ♏x.
Træ Gentian Co. ʒss.
Ess. Limonis ♏i.
Sp. Chloroformi ♏xv.
Aquæ ad ℥i. ter quaterve die.

This rarely fails to reinduce sleep, but if persisted in long after it has produced its effect, sleeplessness returns. When this is the case the tincture of gentian, calumba or chiretta should be given alone.

These remarks I am afraid will have but little interest for the scientific observer, but they cannot, I think, fail to be of use to those engaged in general practice.

To show to what extent alcohol may be present in the blood, I may mention I have known it to burst into flame on a light being applied to a cut head, and Professor Ogston of Aberdeen has told me he has been able to set it alight, when he has cut open the bladder of a man who has died in a fit of alcoholism.

Reviews.

Antagonism of Therapeutic Agents, and what it Teaches. By J. Milner Fothergill, M.D., M.R.C.P. 8vo. pp. 150. London: Macmillan and Co.

This essay, to which the Fothergillian medal of the Medical Society of London was awarded, is intended to give a general view of the subject of antagonism of toxic agents, including both the experiments on their poisonous action, and the practical bearing of these experiments in the treatment of disease. The author begins with a very brief historical sketch of the experimental researches on antagonism, followed by a summary of the results obtained by other workers, and by the author himself in some investigations which he personally made. In the *résumé* which he gives he describes typical experiments, showing the antagonism of physostigma and atropia, of chloral hydrate and of strychnia, of chloral and physostigma, of opium and morphia, of atropia and bromal-hydrate, and of chloral and picrotoxine. The author's experiments were made upon aconite and digitalis, and on atropia and chloral-hydrate. The results of this latter were that atropia tended to prevent death from chloral-hydrate, but was not so effectual in this respect as strychnia. The effects of aconite were little influenced, or were indeed increased, by the simultaneous administration of digitaline; but when digitaline was administered some time beforehand, it tended to prevent the death from aconite. Atropia diminished or destroyed the lethal effect of aconite, when administered either before or shortly after it.

In the next chapters the author considers the effect of drugs upon the rhythmical discharging nervous centres of the heart, vessels, and respiration, and afterwards describes the practical advantages to be derived from a knowledge of the antagonism of drugs in actual poisoning, and, what is still more important, in ordinary medical practice.

The historical sketch which the author gives in this book is the least satisfactory part of it. The work of von Schroff is not mentioned, and we think that sufficient importance is hardly given to the admirable researches of Dr. Fraser. As a whole, however, the book is remarkably interesting and suggestive. A case which the author gives of emphysema and aortic stenosis, in which attacks of dyspnœa came on after admission into hospital, is exceedingly instructive, as showing how a benevolent practitioner, by well-meant but ignorant attempts to mitigate his patient's sufferings, may really do very great harm. These attacks of dyspnœa were traced by the author to the administration of choral by the house physician, for the purpose of lessening sleeplessness. The drug weakened the patient's heart, and brought on the attacks of dyspnœa, in spite of the stimulants which were administered, and when its use was discontinued the attacks at once ceased. Without a knowledge of the action of the various drugs employed in this case, the attending physician might have puzzled in vain over the cause of the dyspnœa, and, by giving information on such points as these, we think that Dr. Fothergill's book is likely to prove both useful and acceptable to the medical profession.

A Practical Treatise on Materia Medica and Therapeutics. By ROBERTS BARTHOLOW, M.A., M.D. New and enlarged Edition. 8vo. pp. 565. New York: D. Appleton and Co.

Two years ago we reviewed the first edition of this work, and the favour with which it was received by the medical profession is shown by the fact that three editions were printed from the stereotyped plates in the first year. In this edition, several new articles have been added, and some alterations have been made in the text. The additions are articles on beverages, vegetable acids, picrotoxine, caffein, grindelia, heat, cadmium, cannabis indica, guarana, phytolacca, digestive ferments, cerium, cuca, pulsatilla, ailantus. Amongst these, it will be seen that there are several drugs, grindelia, phytolacca, pulsatilla, &c., which are not in ordinary use, and there are others which we mentioned in the first edition, such as leptandria and iris, not often used as yet, but becoming known, through the researches of Rutherford and Vignal, as powerful cholagogues. This edition, like the first, bears evidence of having been written by a master of his subject practically acquainted both with the physiological action of drugs as observed by experiment, and their therapeutical uses as shown by clinical experience.

Traité de Thérapeutique appliquée. Par J. B. FONSSAGRIVES, Professeur de thérapeutique et de Matière Médicale à la Faculté de Médecine de Montpellier. 8vo. pp. 810. Tome premier. Paris: Adrien Delahaye et Cie. Montpellier: Librairie C. Coulet, Grand rue, 5.

The present work by M. Fonssagrives is the sequel to the *Principes de Thérapeutique Générale*, which we reviewed just three years ago. In it he discussed the principle of therapeutics; in this one he takes up their applications. This volume discusses the means whereby the nervous system, the blood, circulation, respiration, secretions, nutrition, temperature, and generation may be modified. While taking up the functions of the body very fully, and discussing the various disturbances to which they are liable, and the drugs by which they may be treated, the work, notwithstanding, does not enter in great detail into the action of any one drug. He gives very fully, however, the indications for the application of each drug in disease, in a way which is very convenient to the physician in practice, and he occasionally mentions drugs which we have not seen noticed in any other work on materia medica, such as, for example, the papaw plant, which may, however, yet become very useful in medicine.

Domestic Medicine and Hygiene. By William J. Russell, M.B. 16mo. pp. 412. London: W. H. Everett. Edinburgh: E. and S. Livingstone. Melbourne: G. Robertson.

This little book is intended as a guide to persons who are unable to obtain medical advice. It gives, with very great shortness and clearness, the symptoms and treatment of most diseases, and with such directions for differentiating or diagnosing between them as can be readily understood by any one of ordinary intelligence. It is especially intended for the use of emigrants, and for those living in the colonies at a distance from medical men, and the doses are given not only in ordinary weights, but also in numbers of Thevenot's globules, which we noticed some time ago in this journal. In its size and plan, this work very much resembles the late Dr. Tanner's small work on medicine, and, from the clearness of its language and the terseness of its style, it is not unlikely to prove a favourite with medical students, as well as with those for whom it is more especially intended.

Clinic of the Month.

Treatment of Pruritus.—M. Duhring, in his late work on skin affections, recommends the following treatment of pruritus vulvæ. He mentions most favourably camphor, chloral and borax variously combined:—

℞	Chloral	grs. x. to xxx.
	Water	℥i.

Used as a lotion to the parts.

℞	Boracis	ʒiv.
	Morphiæ sulphatis	grs. viij.
	Glycerine	℥ss.
	Aquæ	vii. ss.
	M.	

These preparations, a little weakened, may be used by injection. For this purpose the following has been found highly efficacious:—

℞	Nitrate of alumina	ʒi.
	Aquæ	℥i.

As an ointment the following is strongly recommended:—

℞	Camphoræ.	
	Chloralis	āāʒi.
	Ungt. aquæ rosæ	℥i.

(*The Canada Lancet*, Sept. 1878.)

Cases of Aneurism of the Aorta treated by Iodide of Potassium.—Dr. Byrom Bramwell records ten cases of thoracic and abdominal aneurism, in six of which considerable relief was obtained by the administration of iodide of potassium in half gramme doses thrice daily. As the cases seem all to have been considerably advanced, it could hardly be expected that cure could be obtained, and in some the relief was by no means lasting. They show, however, that the administration of the drug, when combined with rest, is of some value in the alleviation of symptoms. (*The Lancet*, Nov. 23, 1878.)

Treatment of Aortic Aneurism.—Dr. Carter reports the case of a strong and healthy man who had suffered from no serious illness, but who had strained himself whilst at work, the alleged strain resulting in an aortic aneurism. There was a doubtful syphilitic taint. Beyond absolute rest in bed, iodide of potassium in doses of fifteen grains, combined with the bromide, thrice daily, was the sole treatment during the first fortnight after admission. At the expiration of this period solution of ergot in three-grain doses was administered every morning by hypodermic injection in the neighbourhood of the swelling. Dr. Carter was led to adopt this method of treatment on the hypothesis that the ergotine so far modified or disturbed the nutrition of the sac wall as to favour coagulation of the blood within it. As a result of the methods adopted the patient was discharged as greatly relieved, with scarcely perceptible pulsation, and complaining of no pain. On his re-admission, some three months later, the same treatment was adopted, but without success; the aneurism had in the meantime assumed a much more serious character. Galvano-puncture of the aneurism was therefore resorted to, the needles being insulated to within half an inch of the point, and as fine as possible; the operation lasted fifty minutes. At a subsequent period two other punctures were performed, the operations lasting respectively forty-five to thirty-six minutes. The results in both cases were favourable, and in the latter to such an extent that the patient was soon afterwards discharged in excellent spirits and fair general health, very greatly relieved. (*The Lancet*, Nov. 30, 1878.)

Kinate of Quinia for Hypodermic Injection.—Mr. Henry Collier (*Pharmaceutical Journal*) recommends kinate of quinia as a very soluble salt, adapted for administering hypodermically. He prepares it by converting kinate of calcium into kinate of barium, and this by double decomposition with sulphate of quinia into sulphate of barium and kinate of quinia. The solution which he uses for hypodermic injection contains one in four. (*The London Medical Record*, Nov. 15, 1878.)

On the Origin of Enteric Fever.—Dr. Collie makes some interesting remarks on the origin of enteric fever occurring in the persons of sisters, who were employed as servants at the Homerton Fever Hospital. The closet, which was situated on a lower floor, and was common to twelve persons, had frequently been stopped, and in each case the fever commenced exactly twelve days after a stoppage. Dr. Collie, however, excludes this hypothesis of the origin of the disease, since the other persons making use of the closet were unaffected, although within the age—fifteen to twenty-five—of maximum susceptibility after childhood. A similar source of infection, arising from filth decomposition, to which the patients had been exposed during a short home visit, is also shown to have been without result. Both patients had been in the service of the hospital for more than two years as laundry-maids, so that the disease could scarcely be considered as due to the direct contact of linen soiled by the discharge of patients suffering from enteric fever. Looking at all the circumstances of the case, therefore, the conclusions to be arrived at are that the disease was contracted in the first case from personal communication with a patient suffering from well marked enteric fever, whilst the second patient caught the disease from personal communication with her sister, that is to say, by contagion. The contagion of enteric fever, if not so potent as that of typhus or scarlet fever, is nevertheless a very real and—to persons between the ages of fifteen and thirty—a very great danger. Several nurses have contracted the disease whilst nursing enteric patients, just as nurses have contracted typhus whilst nursing typhus patients. The argument against contagiousness of enteric fever, as upheld by the fact that many nurses escape the disease, is not valid, inasmuch as many may be protected by a previous attack, for enteric fever is very frequent and often very mild during infancy. The practical results to be deduced from these observations are, that in the treatment of enteric fever, isolation should be resorted to, as in cases of typhus and scarlatina, especially where children or young adults are liable to infection. Enteric nurses, unless protected by a previous attack, ought, when possible, to be about forty years of age, and should never be under thirty. The stools, which are probably specific, and at their maximum of infectiousness when discharged, should be removed at once, and disinfected by the only efficient means—burial; and this may be done by the use of an earth closet. (*The British Medical Journal*, Nov. 30, 1878.)

Bryony and Drosera in Pertussis.—In a communication to the Sociéte de Thérapeutique (published in the *Journal de Thérapeutique*, May 28th), Dr. Louvet-Lamare stated that he had derived great advantage from treating the catarrhal stage of pertussis by the tincture of bryony, and the paroxysmal stage by the tincture of drosera. Of the former he gives one gramme per diem to a child seven years old, and although it may not abridge this first stage of the disease, it diminishes the tracheobronchitis very sensibly, and therefore the violence of the cough. When the bronchial tubes are overloaded with mucosities he also administers an emetic. As soon as the paroxysmal character becomes well-established he gives the tincture of drosera (one gramme daily for a child seven years old), and as long as there are any râles heard in the chest he associates the bryony with it. It soon lessens the violence of the paroxysms, but may have to be continued two or three weeks before convalescence is established. When the drosera is only given after the paroxysms have been established for two or three weeks it may cure the disease in a few days. The drosera very much expedites the improvement produced by change of air. The drug is very harmless, and its daily dose may be increased from one to five grammes without doing mischief. M. Louvet-Lamare insists upon the desirableness of accustoming the relatives of children suffering from pertussis to use the thermometer, and thus detect the onset of inflammatory complications. (*Medical Times and Gazette*, August 10, 1878.)

Gatti on Oxalate of Soda in Metritis.—Dr. Gatti (*Revista Clinica di Bologna*, Nov. 3,) alleges that he has obtained excellent results from the employment of oxalate of soda in metritis and puerperal metro-peritonitis. He administers the salt in daily doses of 89 centigrams (12·5 grains) in 125 grains of mucilage. Lange has already spoken favourably of this remedy, not only in metritis, but also in puerperal infection. Gaspari, on the other hand, denies that it possesses any antiseptic property. (*The London Medical Record*, Nov. 1878.)

Asclepias Syriaca in Dropsy.—Dr. Thomas of Kentucky has found Asclepias syriaca of value in dropsy, without reference to the nature of the cause, but especially is it serviceable with engorgement of the liver, being in many cases superior to either calomel, leptandrin, or podophyllin. In no case, when used in doses which come short in effect of causing vomiting, does this remedy fail to cause profuse diaphoresis, and remove dropsical accumulations.

In scrofulous affections he uses it with phytolacca decandra, aided, when needed, with malt-extract and cod-liver oil. He employs the following formula: ℞ strong decoction of asclepias syriaca, ℥ xij.; decoction of phytolacca decandra, ℥ iv.; whisky, ℥ vi.; white sugar, ʒ iv.; mixed. From one-half tea-spoonful to two table-spoonfuls thrice daily, according to age of patient and effect produced.

He uses this formula as a vehicle of salt of iodine or arsenic when required. A tincture made by macerating for fourteen days two ounces of the fresh root thinly sliced is the most convenient form for use as a simple cathartic or alterative and laxative. The infusion is to be preferred when diaphoresis is desired.

Not the least anti-malarial or anti-periodic power has been discovered by Dr. Thomas in the remedy. (*London Medical Record*, Nov. 15, 1878.)

Naphthaline in Catarrh.—Naphthaline, $C_{10}H_8$, has been but seldom mentioned as an external remedy of value; in fact, any notice of it is almost confined to chemical text-books. It is a volatile crystallizable substance, insoluble in water, but soluble in alcohol and ether, and produced in the distillation of tar. It was noticed some while since by the Apothecaries' Company, and it is of value, and worth using in simple bronchial catarrh of middle or advanced life. Reduced to powder and united with a little gum acacia in gr. i.—gr. ij., or advantageously combined with a small quantity of codeia, it not only slightly lessens expectoration, but alleviates cough without interfering with the other secretions; at any rate, when given it has acted well in my hands. It appears to be a stimulant expectorant, possibly having more advantage from the slight disinfectant power it may possess. It has been employed externally by M. Boissière to replace tar unguents in psoriasis, lepra, lichen, and it is useful in eczema, combined with starch, oxide of zinc, or glycerine. (*Medical Examiner*, August 15, 1878.)

Arsenic as a Blood and Cardiac Tonic.—Dr. Lockie of the Cumberland Infirmary calls attention to the remarkable effects obtained from the administration of arsenic in certain forms of anæmia, in which iron and good food have failed to produce any benefit. Certain cases which have occurred in Dr. Lockie's practice, and of which the details are given, are cited to show that in cases of anæmia approaching in gravity the so-called essential or pernicious anæmia, the administration of liquor arsenicalis in five-minim doses was most advantageous. The author also supposes that the remedy might be useful in chorea and phthisis, since both are diseases associated with an anæmic condition. In regard to arsenic as a cardiac stimulant, it is believed to be a valuable adjunct to digitalis, and in ordinary valvular disease of the heart, where there is failure of compensation with its consequent results. Further, it seems to be of great value even in fatty degeneration, and this in spite of the fact that recent experiments tend to show that fatty degeneration of the heart is one of the results of feeding animals with arsenic, *i.e.*, of the administration of arsenic in *large* doses. (*The British Med. Journ.*, Dec. 7, 1878.)

Intravenous Injection of Milk in Anæmia.—N. Wulfsberg has made a series of researches on animals on the effects of the intravenous injection of milk, recommended by Gaillard Thomas, as a means of preserving life in cases of hæmorrhage and other forms of anæmia. He injected about 250 grains, and examined the blood especially with a view to determine whether, as Donné stated in 1844, the globules of milk were converted into white corpuscles. He found that the white corpuscles undoubtedly increase in number, but only after having first taken up—in fact, eaten,—the milk spheres. He was unable to preserve the life of dogs by this means; their weight diminished, and they died without obvious disease, and he found hæmorrhagic infracts in the lungs. He found it impossible to maintain the life of animals by subcutaneous injections of fresh milk, as they became atrophic. If about ·75 per cent. of the estimated weight of the blood were withdrawn from dogs they bore the intravenous injection well, but when large quantities were introduced they rapidly died. The injection of milk caused the sounds of the heart, which were previously inaudible, to become clear and distinct. He thinks, however, a milk injection can never supply the place of an injection of blood. (*The Lancet*, Dec. 7, 1878.)

Milk Diet in Chronic Cystitis and after Lithotrity.—Dr. Teevan, acting upon Dr. George Johnson's method of an exclusively milk diet, has treated a patient suffering from chronic cystitis. After putting his alimentary canal into a fit and proper condition for commencing the treatment, the patient began to take a pint of milk every two hours; his urine thereupon became a mass of muco-pus, and pieces of curdled milk were vomited. At a later period more vomiting occurred, but the urine became quite clear, and the patient was discharged, cured of his cystitis within a fortnight of the commencement of the treatment. Commenting on the above case, Dr. Teevan states, that apart from the probable cure by milk alone of chronic cystitis, which is an exceedingly troublesome and unsatisfactory complaint, there is yet another field open for it, as was pointed out by Dr. Johnson, and that is the mitigation of the irritation which attends or follows the operation of lithotrity. The influence of an exclusively milk diet on the urinary tract and secretion is well seen in cases of children suffering from incontinence of urine, who can often be cured by simply ordering them to eliminate meat from their dietary, and to live on milk only, if possible, or milk and fish, if existence on one aliment cannot be tolerated. (*The Lancet*, Dec. 7, 1878.)

Treatment of the Albuminuria of Pregnancy by Jaborandi.—Dr. Langlet of Rheims publishes an elaborate account of a case of albuminuria during pregnancy, which he has treated successfully by the administration of jaborandi. The patient, three months advanced in pregnancy, showed the ordinary symptoms of albuminuria. The action of the jaborandi on the salivary glands became apparent on the day of administration. The patient took the drug continuously for a period of sixteen days, during which time the œdema disappeared, and the general symptoms were improved. The albumin was likewise lessened to such an extent that not the slightest trace could finally be detected, and the lying-in occurred under the most favourable circumstances. Dr. Langlet has noticed that the administration of the jaborandi caused an increase in the urinary secretion, and this coincides with a somewhat similar observation of M. Rendu, who found that in a case of acute nephritis the drug caused polyuria. On the fifteenth day of the administration of the drug, hæmaturia occurred so as to give the urine a disagreeable odour and a bright red colour. This accident, which did not retard the recovery, is to be attributed to the excessive work imposed upon the kidney by the increased secretion, leading to congestion, and the congestion to actual hæmorrhage. (*Union Médicale du Nord-Est*, No. 6.)

Quinquina in the Diseases of Children.—M. Jules Simon, in a lecture on Infantile Therapeutics recently delivered at the hospital for sick children in Paris, asserts that quinquina should not be administered to anæmic children indiscriminately without distinction of age and nervous susceptibility. He shows that this remedy is specially unsuited for new-born children, and girls of five, eight, and even ten years of age, as it gives rise to various troubles, such as pyrosis, loss of appetite, vertigo, &c., which ultimately necessitate the abandonment of the remedy. The arguments which hold good against the employment of quinquina apply with still greater force in the case of sulphate of quinine. Passing from this subject, M. Jules Simon considers the therapeutic actions of these two drugs. Three varieties of quinquina are distinguished, the grey, the yellow, and the red, differing in the proportion of the alkaloid which they contain as well as in their astringent principles. Thus the yellow quinquina (calisaya) contains more quinine (28-31 per 1000) than cinchonin (6-8 per 1000). The grey quinquina 8·75 quinine and 12·55 cinchonin; whilst the red quinquina (huanuco) contains 8-10 of each of these alkaloids. The chief pharmaceutical forms of quinquina are powder, extract, tincture, quinium, syrup, wines, and salts of quinine. The powder of yellow quinquina is found to be of use in certain cases of intermittent fevers and of miasmal cachexia. The powder of red quinquina is employed for soaking in water and washing; or as a powder in scrofulous, syphilitic, and cancerous ulcers. When used for this purpose the powder should be composed of ten grains of red quinquina; ten grams of vegetable charcoal; and five grams of pulverised camphor. In some forms of dyspepsia allied to chlorosis occurring in girls on the approach of the first catamenia, good results are obtained by the employment of the powder of yellow quinquina mingled with tonic and absorbent substances. Such a formula as the following is useful—yellow quinquina powder, 10 grams; prepared chalk, 10 grams; rhubarb, 5 grams; ferrous carbonate, 4 grams, with the addition, when needful, of nux vomica, codein, extract of belladonna, vegetable charcoal, magnesia, &c. A pinch to be given at each meal. In dyspepsia, accompanied by loss of tone and spasms, the formula—prepared chalk, 50 centigrams; colombo, 20 centigrams; rhubarb, 10 grams; codein, 1 gram; and nux vomica, 1 gram; administered before the chief meal of the day, affords excellent results in girls of 10—12 years of age. Quinium is the alcoholic extract of quinquina; it is a useful preparation very rich in quinine. Thus, quinine contains 4 grams 50; sulphate of quinine, 1 gram, and sulphate of cinchonin, 0·50 gram, whilst 1,000 grams of wine contain but 1·50 gram of the two alkaloids. M. Simon recommends that the alcoholic preparations of the drug should not be ordered for children under two years of age, but only the syrup in doses of a small teaspoonful at a time to be taken before meals. It is sometimes necessary to incorporate the tincture of quinquina with aperient mixtures. The following prescription is useful in such cases for patients whose ages range from five to six years: tinc. quinquina, 20 grams; tinct. gentian, 5 grams; tinct. cascarill, 5 grams; tinct. benzoin, 2 grams; tinc. nux vomica, 1 gram. The mixture to be given in doses of 20 drops before every meal in a little camomile water. (*Le Progrès Médical*, Nov. 30, 1878.)

Local Treatment in Diphtheria.—Dr. A. W. Hagenbuch of the Cook County Pauper Institution gives an account—*Chicago Med. Journ.*, Vol. xxxiv., No. 3.—of an epidemic of diphtheria in which thirty-three patients were treated. The marked features of the epidemic were the limitation of the affection to one house, showing its very slightly contagious nature, the rapid invasion and unfavourable progression, if not interfered with, the low rate of mortality, the subsequent anæmia, and above all the unmistakable benefit derived in nearly every case in which vigorous local treatment was adopted. In all cases, no matter what general treatment was adopted, if the local applications were discontinued for a single day, the case was invariably worse, the cough and difficulty of breathing being especially aggravated. The local applications principally employed consisted of equal parts of the tincture of chloride of iron and dilute nitric acid. The mouth was first rinsed, and the secretions and detached membranes removed with a dry swab, and the above preparation was then applied with a soft brush. There was only one fatal case. (*Brit. Med. Jour.*, Dec. 14, 1878.)

Treatment of Diseased Bronchial Glands.—Dr. Quain in discussing diseases of the bronchial glands, shows that like the lymphatic glands generally, they are subject to congestion, to chronic and acute inflammation, to tuberculous or scrofulous disease, to various forms of malignant diseases, and to pathological changes in secondary or tertiary syphilis. The symptoms which are more or less characteristic of the presence of enlarged bronchial glands are cough, pain referred to the situation of the fourth and fifth dorsal vertebræ at one or both sides of the spinal column, with tenderness on pressure over the seat of pain, difficulty of breathing, difficulty of swallowing, hæmoptysis, congestion and puffiness of the face, expectoration of mucus, loss of voice and sometimes vomiting. The general or constitutional symptoms connected with the malady under notice are in nowise peculiar. Physical examination showed that dulness was present between the margin of the scrofula and the spinal column at one or both sides, on a level with the fourth and fifth dorsal vertebræ; flattening of the affected side together with the diminished mobility. The respiratory sounds were variously modified, marked tubular breathing, very loud expiratory murmur, and feebleness of the respiratory murmur as a whole, being respectively observed in various cases. In several cases of bronchial gland enlargement treatment has proved very effective. Such cases would seem to be those of simple chronic enlargement. Many such have yielded to the use of iodide of iron in the form of pill or syrup, and to the external application between the shoulders of a solution of iodine composed of equal parts of the tincture and liniment of iodine. The same treatment has likewise proved very effective in cases in which a syphilitic origin could be traced. Symptoms such as cough, difficulty of breathing, pain as well as dyspnœa, loss of flesh, &c., will all require more or less suitable treatment. The cough and difficulty in breathing may in some cases be relieved by simple expectorants or anti-spasmodics. A useful application when pain is a prominent symptom, is an embrocation of belladonna liniment, laudanum and spirits of camphor. A couple of drachms of this composition sprinkled on the surface of piline and applied to the painful part for a few minutes, often afford relief. Hypodermic injection of morphia may be required when pain is very severe. Under all circumstances it is necessary to improve the general health by wholesome diet, and those other conditions which promote good digestion and elimination from the excreting organs. (*British Med. Jour.*, Dec. 14, 1878.)

Extracts from British and Foreign Journals.

Trophic Relations of the Vagi to the Muscular Substance of the Heart.—From experiments made by Professor Hermann Eichhorst of the University of Göttingen, he has come to the following conclusions:—That in birds death ensues with certainty after division either of one or of both vagi; that this death is not due to an affection of the lungs, but to an affection of the heart. Pneumonia depending upon the destruction of the vagi does not occur in birds, but after the division of those nerves, acute fatty degeneration of the muscular substance of the heart takes place. This fatty degeneration is due to paralysis of certain definite nerve fibres contained in the vagi, which have the exclusive function of presiding over the nutrition of the muscular wall of the heart, and are purely trophic nerves in the most precise sense of the term.

When the vagi are divided in rabbits, and care is taken to prevent foreign substances entering the lungs, and thus to avoid the inflammation which would otherwise be caused by them, death still occurs in about two days. The lungs themselves are little affected, but the muscular substance of the heart is found to have undergone considerable alteration. The muscular fibres are not fatty, as in the fowl, but their structure is destroyed, the striated appearance being completely gone, and the protoplasm collected in little lumps, as if it had undergone partial coagulation. Both before and after treatment with osmic acid, the muscular fibres present a peculiar lustre, exactly resembling that of fibres which have undergone waxy degeneration. In dogs, similar appearances are observed, but in them pneumonia more frequently occurs. It would appear that the trophic fibres contained in the vagi are entirely distinct from the inhibitory fibres. The inhibitory fibres proceed almost entirely from the spinal accessory nerve, and afterwards join the vagus, but the evulsion of the spinal accessory has not the same results as division of the vagi. This clearly shows that the trophic fibres proceed from the vagus itself, and not from the spinal accessory. (*Pamphlet—Berlin. Die Trophischen Beziehungen der Nervi Vagi zum Herzmuskel.*)

A Case of Poisoning by Barium Carbonate.—Dr. Reincke reports the following case of poisoning. Four persons who had eaten pastry prepared from flour which had in some unexplained way become mixed with carbonate of barium, were seized a quarter of an hour afterwards with vomiting and diarrhœa, accompanied with malaise and a feeling of tightness in the skin. Three of the patients who were young women partook afterwards of milk, and thereby promoted vomiting and suffered only from weakness, particularly in their lower limbs, on the following day. The fourth, however, an old man of sixty-eight, who only vomited some hours later, was attacked with diarrhœa on the succeeding day and with paralysis of the legs. The paralysis extended to the trunk, and caused death the same evening. The post-mortem examination gave no results as regards the stomach and intestines, and a dark colour of the grey substance was alone perceptible in the brain. Similar symptoms occurred in dogs and birds which were fed with pastry made of this flour. (*Eulenberg's Vierteljahrsschr.* xxviii. p. 248.)

Curare in the Treatment of Epilepsy.—At a recent meeting of the German Association at Cassell (*Allg. Wien. Med. Zeit.* October 1), Dr. Kunze gave an account of the trials he had made of curare in the treatment of epilepsy. Out of eighty cases treated, six he regarded as cured, the fits having ceased for five years or more. He found that this remedy had a great advantage over the bromides, which only postponed the attacks for about half a year. Commencing with doses of a milligramme and working upwards, he soon found that even large doses could be borne. He watched his patients closely after they were administered to observe the effects. The doses to which he attained would excite surprise. Thus to three grammes of water he added five decigrammes of strychnia, using this for eight injections. The early symptoms of narcosis, such as a little giddiness, and a misty veil before the eyes, passed away in three-quarters of an hour. He soon diminished the above quantity, adding only three decigrammes to five grammes of water and a drop or two of hydrochloric acid, and dividing into eight injections. No symptoms of poisoning were induced in the cases treated; but it is with this remedy as with strychnia, which exerts no influence if noises in the ears are not produced. So here no effect is produced, unless there is a veiling of the vision. An important point to note is that the cases may be divided into two classes as regards this treatment. First, there are those in which there have been only one or two attacks, or in children, in which a single injection may suffice; but, as a rule, a second attack follows in three or four weeks, and then we should observe what time has passed between the injection and the new attack, taking care to make the new injection before the same period of time again has elapsed. (*Medical Times and Gazette*, Nov. 2, 1878.)

The Effect of Certain Poisons on the Temperature of the Body.—Dr. Tamassin, Prof. of Medical Jurisprudence in the University of Pavia, has published an account of experiments he has undertaken, with the view of determining the effect of poisons upon the temperature. In the case of arsenic, a dog had three grains of arsenious acid injected into its thigh, and in thirty-nine minutes was dead. The temperature fell from 40° C. (104° F.) to 37·7° at the moment of death, a difference of 2·3° C. (4·34° F.). In a second experiment also on a dog, where two grains were injected, death took place in seventy-five minutes, and the temperature fell 4·1° C. (7·38° F.). In a rabbit which died in an hour after arsenical poisoning, the difference in temperature was 3·2° C. (5·76° F.). In the case of phosphorus the loss of heat was still more marked. In three experiments on dogs, when four grains of phosphorus were given, the thermometer fell almost equally, the maximum fall being 4·7° C. (8·46° F.). In a rabbit which died in eight and a half hours the thermometer fell 7·1° C. (12·78° F.).

In the case of strychnia the rise is even more rapid than the fall in the cases of arsenic and phosphorus. Experiments were made on three dogs, the first died in forty minutes, when its temperature had risen 3° C. (5·4° F.); the second in thirty-three minutes, the temperature rising 2·5° C. (4·5° F.); and the third in twenty-nine minutes, the temperature rising 3·3° C. (5·94° F.). These researches suggest that the clinical thermometer may hereafter aid diagnosis, in cases where there are suspicious symptoms of poisoning. (*The Dublin Journal of Medical Science*, Nov. 1, 1878.)

A Simple Method for the Examination of Blood Microscopically for Spirilla.—Albrecht recommends a close study of the putrefactive bacteria of the blood in recurrent fever. A drop of blood is spread upon a glass plate so as not to be in too thin a layer; it is allowed to dry up when all the fibrin masses and blood corpuscles are destroyed; a few drops of acetic acid are then added to the blood, the acid being renewed after a few minutes' interval. The preparation is then washed carefully with distilled water, which must not be applied in a stream. The blood is afterwards allowed to dry a second time. Six to twelve hours later the nuclei and nucleoli of the white corpuscles are alone visible, amongst which are the spirilla appearing distinctly larger. The preparation can be preserved in glycerine or Canada balsam, after staining, of a red violet or aniline brown colour. (*Rundschau*, July 1878.)

Some Observations on Cases of Whooping Cough.—Dr. Swan, of South Chicago, records the results of the treatment of fifty cases of whooping cough occurring in his practice, in the following words. Of forty-two cases visited after the quinine medication, three were so mild as to require no treatment; no record is given in six cases; and six children utterly refused the medicine in consequence of its bitter taste. Two died, one of spasm of the glottis, the other of marasmus. Eight patients received no benefit whatever from the quinine and tannin. In two cases marked relief was afforded. In the case of fifteen patients the disease was completely abated in an average period of 3·8 days, three of the cases being complicated by pneumonia, and two by capillary bronchitis. The author therefore concludes that the use of a solution of quinine and tannin internally in whooping cough may be employed with advantage in many cases. The remedy referred to, is one which was introduced by Professor Binz, of Bonn. It is a solution of quinine and tannic acid, four grams of the former to one gram of the latter, in water, syrup, liquorice, or any agreeable elixir, the dose to be proportioned to the age of the child. The remedy should be used in solution to produce the full effect. There is thus produced upon the fauces and epiglottis a marked local effect, due to the intensely bitter taste of the quinia, and it is this effect which unquestionably contributes to the value of the medication, though it also acts as an antispasmodic. (*The Chicago Medical Journal and Examiner*, Aug. 1878.)

The Etiology of Mumps.—Dr. Isham in treating of the etiology of mumps and the rationale of the secondary manifestations or so-called metastases, records that jaborandi has in at least two cases cured orchitis arising from the metastasis of mumps: whilst an emetic is said to cure parotiditis unfailingly in twelve to twenty-four hours. The reason for these results is thus given by Dr. Isham. The time when such agents would be likely to be employed would be in the stage of greatest enlargement, just before the decline. Jaborandi is to be classed as an emetic, while it may exert a sialagogue and sudorific action without emesis: just so may ipecacuanha belonging to the emetic class, which is absorbed into the blood and acts precisely as jaborandi. They cause dilatation of, and retardation of flow through the surface capillaries by paralysis of the sympathetic fibres distributed to them. Hence the drugs cause copious sweating and secretions from mucous surfaces. In case of parotid enlargement, the increased blood-pressure in the parts contiguous would tend to augment the pressure exerted upon the ducts and clear them of their obstruction by bursting the occluding cells. The secretory activity of the gland would also be stimulated through the afferent nerve fibres, by the taste impression, and also by the relaxation of the sympathetic. In this way the tubes would be relieved of all impediment. It is clear that the enhanced pressure in tegumental structures, which relieves itself by such remarkable overflow upon the surface and into mucous passages would exercise a powerful depletory effect upon the part which becomes the seat of effusion. It must speedily reduce the seat of tumefaction whether the organ possess within itself any excretory office or not. (*American Journal of Medical Science*, Oct. 1878.)

The Physiological and Therapeutical Action of Thymol.—Dr. Küssner has taken as much as one gramme of thymol in the course of twenty-four hours in the form of pills of 0·1 gramme for a period of four days without observing any effects beyond a slight burning in the epigastrium. The respiration, pulse, and body temperature remained normal, diuresis was not increased, and the excretion of urea remained unaltered. The pain and sensibility to pressure of the epigastrium remained for nearly a fortnight after discontinuance of the remedy. In a case of diabetes in which the author administered one to two grams. of thymol daily, the sugar in the urine was decreased without the appearance of any general symptoms. Thymol appears to act usefully in cases of catarrh of the bladder, and in the diarrhœa of children, when administered daily to the extent of three to five drops of a one per cent. solution; or a teaspoonful hourly of a solution of 1 in 2000. It is also of use in cases of phthisis when given by inhalation (1:1000) for purposes of lessening fever and expectoration. In the case of rabbits and dogs, thymol caused death when injected in the form of an emulsion (1 : 100—200) directly into the vascular system to the extent of 0·1 per kilogram of the body weight. Three to twenty times this lethal dose administered subcutaneously or by the stomach caused only local irritation owing to the defective absorption, without any further results. After injection into the abdominal cavity of a two to five per cent. emulsion well marked narcosis appeared with slowing of the respiration, death occurring from paralysis of the respiratory centres after an interval of three to fifteen minutes, according to the strength of the dose. Aqueous solutions of thymol injected into the same place were without action. Artificial respiration was often successful in restoring life, even in those later stages when reflex irritability had entirely disappeared, and when the blood-pressure had sunk to zero. The blood of animals poisoned with thymol is dark and fluid, the blood corpuscles remain uninjured, and the number of red corpuscles is not diminished. The author has constantly found albumin and hyalin casts, but never hæmoglobin in the urine. After successive injections of 0·6 grammes of thymol into a dog weighing 3,800 grammes, a lowering of temperature by 0·9° C. was observed in the course of three hours. In two puppies aged eight and ten days respectively, it was ascertained that for every 5cc. of a 1 per cent. thymol emulsion injected into the abdomen, the temperature in the stronger animal almost immediately sank 2° C., whilst in the weaker it was lessened 6° C. In both cases the normal temperature was again reached within two hours, whilst the animals suffered no further injury. The frequency of the pulse and the blood-pressure did not exhibit any constant changes at the commencement of narcosis. The blood-pressure gradually sank to zero, and the pulse in correspondence with the lowering of the blood-pressure was at first more frequent and then slower. Strychnia caused no effect in animals poisoned to the deepest coma with thymol. Tetanus, however, could be induced during the soporific stage by the injection of thymol into the external jugular vein. The original condition recurred on the disappearance of the reflex cramps, and death succeeded to a deep coma. Three rabbits which received once or twice daily an injection—passed directly by means of a catheter into the stomach—of 5, 10, and later of 20cc. of a 1 per cent. emulsion of thymol, and of which one lived for four weeks, became decidedly thinner in spite of good food and undiminished appetite, the temperature, pulse, and respiration remaining normal. Examination showed that there was only a moderately anæmic condition of all the organs, whilst the blood appeared normal both broadly and on microscopical investigation. The collection of fat around the internal organs described by Husemann as resulting from poisoning by thymol is not confirmed by Küssner after the examination either of his acute or chronic cases of poisoning by this substance. (*Habilitationsschrift*, Halle, 1878, and *Cbl. f. med. Wiss.*, Nov. 9, 1878.)

The Prevention of Puerperal Fever.—The idea that puerperal fever is of septic origin is rapidly gaining ground in Germany, where it is now generally admitted to be a disease identical in its origin and course with septicæmia as it appears in the surgical practice of hospitals. The question how to prevent its occurrence is now engrossing obstetricians. In 1870 Dr. Bischoff, of Basel, advised that as soon as labour began a bath should be taken by the patient, and that during the whole of the labour the vagina should be washed out every two hours with a two per cent. solution of carbolic acid. The medical attendant should be careful to wash his hands in a three per cent. solution of carbolic acid, and should always anoint his finger with carbolised oil before making a vaginal examination. In cases where the fœtus was dead and decomposed, or where the hand had to be passed within the uterine cavity, the uterus should be washed out with a three per cent. solution of carbolic acid. During the convalescence frequent carbolised injections should be made into the vagina and uterus for thirteen days. Any visible wounds found in the vagina should be touched with a ten per cent. carbolic acid solution immediately after the termination of the labour; and a pad of wadding soaked in carbolised oil should be placed in the vagina and constantly renewed. This method has resulted admirably in greatly reducing the mortality and the numerous forms of mild puerperal diseases which were formerly of such frequent occurrence. Professor Zweifel, of Erlangen, advises however a method of procedure much more simple, and one which seems to yield equally favourable results. All vaginal examinations during pregnancy are made with the hand, which has first been anointed with carbolised oil: the vagina is subsequently washed out with a carbolic solution. All visible rents in the vaginal tract are touched with a mixture of salicylic acid and starch in the proportion of one to five. Fehling suggests that in addition to this, the vagina should be syringed out several times a day with solutions of one-eighth to one-tenth per cent. of salicylic acid. Langenbuch, Schülein, Richter and Schücking, have also contributed valuable papers, all strongly advising the use of an antiseptic treatment during the post-partum convalescence. Professor Spiegelberg of Breslau, has, since 1874, followed this method of treatment with the results of only five deaths in nine hundred labours. (*The Boston Med. and Surg. Journ.*, July 11, 1878.)

Strychnine Poisoning.—The *Revista Medica Quirurgica* of Buenos Ayres for May 8th, records the case of a young man, aged 19, who voluntarily swallowed two grams of crystallised strychnine at midnight, after a full meal. He was not discovered till five next morning, when he was suffering from violent tetanic convulsions, with symptoms of asphyxia. A pint of olive-oil was administered through an interval between the teeth, whilst an enema of 500 grams of brandy in a like quantity of water was administered together with two grams of laudanum, the anus being at the same time plugged to secure the retention of the fluid. At half-past five the following solution was introduced into the stomach. Potassi iodidi four grams, iodini. pulv. one gram, dissolved after trituration in one litre of water. The tonic convulsions lasted about half an hour, succeeding to a complete calm, in a body entirely rigid. The pulse was thready, respiration short and frequent, and a cyanotic tint covered the integuments, particularly of the face and neck. Stimulant frictions were made over the whole thorax for half an hour, and were succeeded by an easing of the breath. The patient was completely restored four days after the ingestion of the poison. The antagonistic properties of the laudanum and brandy appear in this case to have been of the greatest value, whilst the antidotal value of the iodinic solution was of secondary, if not equivocal importance. (*The Canada Lancet*, Aug. 1, 1878.)

The Treatment of Dysmenorrhœa.—Dr. Woodbury, of Washington, introduces a very small tent of elm bark into the cervix about a week before the menstrual flow commences. After introducing the tent, a plug of cotton, to which a cord is attached, is passed through the speculum to keep the tent *in situ*. The plug is then saturated with carbolic acid and olive-oil, or glycerin, in the proportion of 1 : 7. By means of the cords attached to the tent and plug, the patient removes them the next morning, and uses an enema of water and Castile soap. In an obstinate case, a tent is used every day up to the time at which the flow should commence, unless it is established sooner, substituting larger and larger ones as the cervical cavity becomes dilated. As soon as the tent, on removal, is found to be freely stained with blood, its use is suspended until a week before the next period. The remedies administered internally are concentrated tincture of helonias, fluid extract of ergot, tincture of gelseminum; or syrup of the iodide of iron. The patient commences to take one of these three weeks before the regular date of her flow, and continues it till this is fully established. She then suspends it for a week or ten days, after which she resumes it. Sometimes better results are obtained by using two of the above-mentioned remedies alternately, as the helonias and the iron, or the ergot and iron. A gentle current of electricity is passed through the uterus once a day for two or three days before the period. This treatment has been successfully employed in cases of dysmenorrhœa due to subacute inflammation or displacement resulting in the constriction or occlusion of the cervix. (*Virginia Med. Monthly*, Sept. 1878.)

Tartar Emetic in Pneumonia.—Professor Hardy has resorted to the practice of administering large doses of tartar emetic in a case of pneumonia. This treatment was formerly common in Italy and France. The patient was nineteen years of age, and exhibited signs of pneumonia of a dangerous character. The face was very pallid, and his constitutional powers were much shattered, whilst facial herpes which in pneumonia is always of very bad augury, manifested itself. Fever was also very intense, for whilst in pneumonia the pulse ordinarily oscillates between 100 and 110, it here reached 120. The respirations were from 40—50, and there was considerable dyspnœa. The lower three-fourths of the lung were gravely affected, and the crepitant râles at the upper portions indicated that the disease continued to progress. Treatment by repeated bleedings on Bouillaud's plan was contra-indicated by the weakness and pallor of the patient. Blisters, Professor Hardy thought insufficient; whilst alcohol, although useful, does not cure pneumonia, but only furnishes the patient with sufficient strength to await the end of his disease, enabling him to last longer than it, and to become cured of it. Professor Hardy has therefore had recourse to the old practice of giving large doses of tartar emetic, believing that the antimony acts on the inflammatory disease solely by the induction of vomiting and purging, and for this purpose it is necessary to produce the evacuant effect in the most marked manner. He therefore orders from twenty-five to thirty centigrams in a mucilaginous mixture of which a table-spoonful is taken every two hours, following each dose by a tepid tisane or sugar-and-water, in order to produce efficient vomiting and purging. But when vomiting has been produced three times, and purging four times, he leaves off the medicine, for fear of producing too much depression. In the present case but two table-spoonfuls of the mixture had to be given before sufficient vomiting and purging were produced. And on the evening of the day on which it was given the temperature sank considerably, and by twenty-four hours after the antimony was commenced it had sunk from 40° C. to 37·7°, the pulse falling to 70. The breathing was easy and the physical signs were far more favourable. A mixture, consisting of twenty-five grams of brandy, was then prescribed in order to keep up his strength, and the next day the thermometer indicated 36·7°, and the pulse was only 66; and by forty-four hours after the antimony had been taken the lung had returned almost to its normal condition. The case is very interesting in a clinical and therapeutical point of view, for when we leave pneumonia to itself, merely keeping up the strength of the patient by brandy and wine, an abatement of the fever takes place, but the amelioration is only temporary, and it returns. In the present case, however, the anatomical condition of the lung itself was modified by the treatment, so that in forty-eight hours after the tartar emetic was given, all physical signs had disappeared. This fact proves the real efficacy of energetic treatment whether by bleeding or by tartar emetic. (*Medical Times and Gazette*, Aug. 10, 1878.)

The Pharmacology of Camphor.—Carl Wiedemann considers the action of camphor upon the nervous system; he finds that it stimulates the cramp centre in the medulla oblongata, thus giving rise to epileptiform convulsions when administered in large doses. The spinal cord is not influenced by the drug, for the convulsions do not appear after separation of the medulla from the spinal cord even after a dose of 5 grams of camphor. Moreover in man there is a disturbance of the psychical functions, delirium, hallucinations, and giddiness. The action of camphor upon the organs of circulation has been investigated in the frog by Heubner, who finds that it acts as a direct excitant to the heart, since muscarin, a poison which acts by stimulating the vagus and so slowing the heart's action, produces no such retardation after the administration of camphor. Wiedemann, basing his experiments upon this observation, has shown that the action of the camphor was due to the direct paralysis of the centres. The blood-pressure is also increased at the commencement of the convulsions if the medulla remains intact, but it has not yet been determined whether the camphor acts by paralysing the vaso-motor centres of mammals, though it clearly stimulates some of the vaso-motor centres of the medulla, but may occasionally have no such influence on the vaso-motor centres of the spinal cord. After section of both vagi in a cat, no rise in the blood-pressure is observable even after a large dose of camphor. The decomposition of camphor in the organism is shown by the fact that after the administration of 20 grams of camphor daily to medium-sized dogs for twelve to sixteen weeks, there was nothing more than a trace of the smell of the drug perceptible in the urine and fæces. The symptoms of poisoning which appeared after large doses of camphor, disappeared after a few hours. (*Arch. für experi. Path. und Pharmak.* vi. Bd., iii. und iv. Hft. and *Rundschau*, Sept. 1878.)

Hemp-Smoking in Tetanus.—Mr. Khastagir has successfully treated five cases of traumatic tetanus under the effect of ganja (hemp) smoking. Hemp-smoking has been long known as a remedy in cases of tetanus, but it has lately fallen into disrepute, owing, as Mr. Khastagir supposes, to the use of the Indian hemp by the stomach instead of by smoking; from the insufficiency of the number of doses ordered, since the effect wears off in the interval; or from the drug being used as an auxiliary to some more potent remedy, in which case its effect is unnoticed. It is therefore proposed to administer the ganja by causing an attendant to keep a smoking-pipe ready near the patient, charged with about 15 grains of the dried leaves, either alone or mixed with twice the amount of dried tobacco-leaves. On every reappearance of a chronic spasm, the patient is made to smoke the pipe till the leaves are burnt to ashes, on which the muscles of the body instantly relax, the patient shuts his eyes and apparently falls asleep. The attendant again charges the pipe with dried ganja leaves, and watches the patient for the advent of the next spasm to again make him smoke the ganja. In this way the drug has been administered day and night uninterruptedly, during which the irritation of the nervous system slowly, but steadily, yielded to the effect of the drug. The longest time which the hemp takes to cure the disease has—according to the author's observations—been six weeks, the shortest seven days. The only auxiliary medicine that need be used in the course of the treatment, is an occasional dose of purgative mixture by the mouth, or enema by the rectum to relieve constipation. In one case a dose of hydrated chloral was required to be given at night to produce sleep. Milk and soup are the only nutriments which the patient can or should take, until he is able to masticate or swallow solid food ; without giving occasion to fresh attacks of clonic spasms. The ganja-smoking has the advantage over the ordinary methods of treatment by Calabar bean, belladonna, &c., inasmuch as its use is self-regulating and the attendant at once knows when enough has been given, whilst the recurrence of the spasm shows that a fresh dose is required. The drug, however, cannot be administered in this way to children, who either cannot or will not smoke. Hence it is of no value in tetanus or trismus of new-born children. (*The Indian Med. Gazette*, Aug. 1878.)

Abnormal Lowness of Temperature and its Dangers.—Whilst increase of temperature occurring in various morbid conditions is always carefully noted, deviations in the opposite direction are seldom alluded to. In an inaugural dissertation published at Berne, Dr. Glaser points out that instances of this latter phenomenon are more common than is usually supposed, that a temperature between 34° and 35° C. may be frequently met with, and that a fall below 30° C. is not very rare. Low temperatures are not indicative of danger, to the extent commonly supposed ; recovery has been known to take place after temperature of 24° and 26° C. The danger in any given case is to be estimated not only by the fall in temperature, but mainly by a reference to the causes to which it is due ; and the variations in temperature, often great and occurring under normal conditions, must be taken into account. Dr. Glaser also points out that sub-normal temperatures do not always accompany relapse, but that the two conditions may occur quite independently of each other. (*Medical Examiner*, Aug. 8, 1878.)

Poisoning by Bisulphide of Carbon. — Dr. Davidson reports a case of poisoning by this substance ; the patient was admitted into the Liverpool Royal Infirmary. The quantity of the poison swallowed was less than two ounces of the commercial substance. The principal symptoms were a semicomatose condition accompanied by relaxed muscles, occasional convulsive tremors or shiverings, together with pallor and blueness of the lips. The pulse was 110° normal and regular. Warm water was injected into the stomach by means of the stomach-pump, when it was immediately vomited with strong odour of carbon bisulphide. The bowels were evacuated; motions of light colour and of ordinary fæcal odour. Three ounces of mucilage were administered every quarter of an hour, the patient repeatedly vomiting it with the strong odour of carbon bisulphide; always sleeping and breathing deeply in the intervals. On the following day both the urine and fæces smelt strongly of the same substance. Entire recovery ultimately took place. (*The Medical Times and Gazette*, Sept. 21, 1878.)

Poisonous Effects of Salicylic Acid.—Dr. Compton of Indiana collects such cases, from various sources, as tend to show that salicylic acid has a depressing effect upon the system generally, so as to cause delirium and feeble pulse, and in extreme cases death. He therefore guards the profession against what must be admitted to be a dangerous element, contained in this valuable remedy when rashly or improperly administered. Whether this danger to life consists in an idiosyncrasy of the patient, a peculiarly diseased condition of the lung tissue, the brain substance, a diseased condition of the muscular or valvular structures of the heart, or consists solely in the administration of overdoses of the remedy, are questions which should claim the consideration of the physicians who prescribe salicylic acid. (*The Saint Louis Med. and Surg. Journ.* Aug. 1878.)

The Action of Pilocarpin on the Pulse.—Dr. Petrina shows by means of sphygmograph tracings that in certain acutely sensitive persons, or in individuals suffering from disease of the heart, one or two doses, consisting of a half to one syringeful of a 2 per cent. pilocarpin solution, causes a slowing of the pulse and arhythmia. Dengeneration of the muscular substance of the heart, compensated disease of the valves, or impediments to the circulation arising in other parts, such as marked emphysema of the lungs, great exudation from the pleura, or high fever, require that great caution should be exercised in the administration of pilocarpin, lest collapse should occur. (*Deutsches Arch. f. klin. Med.*, xxi. s. 416.)

The Treatment of Diabetes.—Dr. Fürbringer has had an opportunity of studying the effects of various remedies upon the elimination of sugar and urea in three grave cases of diabetes occurring respectively in the persons of a man aged forty-two, of a widow aged forty-three, and of a servant aged twenty-three, the conditions being as nearly as possible similar. The sugar was estimated by means of the polaristrobometer, the urea by Liebig's method. Particular stress was laid upon the relationship of the nitrogen to the urea in the first case, for the greater the relative quantity of sugar under the influence of a remedy, the more favourably does it act. Besides effecting the elimination of sugar the value of a remedy is in direct proportion to the decrease in the amount of nitrogenous elimination which it causes. If, therefore, a medicine increases the elimination of sugar, such elimination is of small importance so long as the elimination of nitrogen is not at the same time increased; in other words, a remedy is of use in exact proportion as it increases the quantity of sugar eliminated, and consequently a remedy which does not alter the elimination of sugar is still useful if it increases the relative amount of sugar excreted. From these considerations, there were administered (i.) salicylate of soda in doses of 5 to 10 grams daily with the following results:—In the third case no action in any way; in the other two cases, however, the elimination of nitrogen was diminished, and in case II. the proportion of sugar, though to a less extent than the nitrogen. (ii.) Phenol in doses ranging from 0·3 to 1·5 grams a day in pills, in case II. the elimination of nitrogen was increased, whilst the elimination of sugar was very slightly lowered. (iii.) Sodium benzoate in doses of 10 to 15 grams per diem increased in one case the quantity of nitrogen eliminated, whilst it was without influence upon the sugar: this observation agrees with the result obtained by Gäthen. (iv.) Thymol, as an emulsion to the extent of 1 gram a day, increased in one case the quantities of sugar and nitrogen eliminated. (v.) Quinine, administered in case II. in doses of 0·9 to 3 grams daily, decreased the elimination of sugar to a small extent; the nitrogenous excretion was at first somewhat increased. (vi.) Digitalis increased in case I. the elimination of both sugar and nitrogen, causing in case II. disturbances of digestion, and, as a consequence of these conditions, a diminution of both. (vii.) Arsenious acid had no perceptible result in case I. (viii.) Potassium bromide, in doses of 10 to 15 grams per diem, increased the elimination of urea, sugar, and nitrogen very markedly. (ix.) Oil of turpentine, administered by inhalation to avoid disturbances of digestion, acted similarly. (x.) Pilocarpin gave no perceptible results. Under the influence of this remedy the sweat contained but a trace of sugar, whilst the saliva was entirely devoid of it. (*Arch. f. klin. Med.* xxi. p. 468, and *Cbl. f. med. Wiss.*, Nov. 2, 1878.)

Königshöfer on the Action of Pilocarpin and Jaborandi on the Eyes.—The investigations were made upon human eyes the experiments gave the following results:—Water and alcoholic extracts of jaborandi exerted no action. Infusion of jaborandi taken internally caused moderate spasm of accommodation with approximation of the near point, flickering scotoma, and increased lachrymal secretion. Pilocarpin muriaticum, applied topically, caused considerable myosis and slight spasm of accommodation; after a hypodermic injection, however, there was spasm of accommodation, accompanied by an approximation of the near point, and lessened myosis, together with an increased secretion of tears. (*Klin. Monatsbl. f. Augenheilk.*, June 1878, and *Cbl. f. med. Wiss.*, Nov. 2, 1878.)

Cota Bark in the Diarrhœa of Children.—Dr. Parsons finds that cota bark has been beneficial in every case of infantile diarrhœa in which he used it, with a single exception. The same remedy has also been employed with success in seventeen cases by Professor von Gietle, of Munich. The forms in which the bark was used were the compressed pill for adults and the elixir for children, administered in doses of vi. to xii. gtt. every one to three hours, as necessity seemed to advise. In one case—the shortest—three doses were given, whilst the longest time for which the drug was employed was seven days. The quina cota is a tree growing in Bolivia, South America. There are several varieties of the species cota, some of which yield paracotoïn instead of cotoïn, the former seeming to bear the same relation to cotoïn as cinchonidia to quinia. Cotoïn is the alkaloid contained in the bark; it is difficult to isolate, and is a resinous substance. The advantages claimed for the cota bark are its tonic and specific action without narcotism in the treatment of acute and chronic diarrhœa. (*The New York Medical Record*, Oct. 12, 1878.)

Glycerine in Constipation.—Dr. Hanson has used glycerine successfully as an injection per rectum for constipation and for the evacuation of the bowels, either for the acute or chronic disease. He makes use of a mixture of one part of glycerine to six, eight, or ten parts by measure of tepid water, and he finds that it acts more pleasantly and efficiently than any other agent employed for that purpose. (*The New York Medical Record*, July 13, 1878.)

The Influence of Malaria on the Liver.—Dr. Sullivan in an article on this subject, points out that marsh miasma when absorbed, infects, impregnates, and poisons the blood, and this modified blood is the cause of the anatomical lesions which are subsequently observed in the organs of circulation more especially in the spleen and liver, the two organs most directly concerned in the formation and depuration of blood. The influence of malaria acts differently on the tissues of the liver and spleen. The first becomes congested, enlarged, hypertrophied, but indurated; the second enlarged, but softened. In the former, induration is the rule, softening the exception; and softening in the liver corresponds with diminution in volume. In marsh cachexia the tissue of the liver assumes a variety of shades of colour, the effect rather of altered secretion than of circulation. In such cases a large quantity of pigmentum nigrum is found, often giving rise to dysentery and diarrhœa. According to Griesinger, diminution in size of the liver is due to pigmentary embolism, and sometimes to fatty degeneration. Dr. Sullivan has never yet been able to trace inflammation or abscess of the liver in marsh fever, unless there had previously existed some recognised hepatic disease. A healthy man in a tropical climate may, therefore, fall a victim to an aggravated form of malarial fever, and yet have no affection of the liver, although constant exposure to malarial causes and to great heat will predispose the liver to disease. Constant exposure to great heat diminishes the functions of respiration and digestion, whilst it increases those of the skin and liver. From an increase in the functional activity of the liver results the frequency of its lesions; no morbid cause is, therefore, more capable of increasing these lesions than a constant exposure to great heat. The poison of malaria affects the texture and functions of the liver. The subject of marsh cachexia is jaundiced, because of the interference with the normal metamorphosis of bile. He is pale and anæmic; his heart beats with a sense of suffocation and giddiness; his gait is slow and painful; he is sad and careworn; he labours under ascites or serous infiltrations; he is subject to alternations of heat and chills, because the process of oxygenation in the liver and the functions of sanguification and of depuration of the blood are interrupted. A patient who suffers from a structural or functional disease of the liver through the continued, but slow and insidious operation of marsh malaria, may drag on a painful existence for months and years. He relapses, he declines, and finally succumbs to the influence of a melancholy cachexia. (*The Medical Times and Gazette,* July 27, 1878.)

The Treatment of Sore Nipples.—Dr. Haussmann, of Berlin, recommends compresses soaked in a 5 per cent. solution of carbolic acid, and changed every two or three hours, as the best remedy for sore nipples. If both breasts are affected, and, nevertheless, suckling has to be carried on, the nipples must be carefully washed each time, before the infant is put to them, to prevent poisoning by the acid. The great advantage of the latter over all other applications is, according to Haussmann, its capability, not only of reaching and superficially cauterising the open mouths of the most superficial lymphatic vessels laid bare in the wound, but also of penetrating completely into them so as to destroy any parasitic germs or infectious organic bodies of any kind which may be brought to the nipple by the child's mouth, the hands of the mother, doctor or nurse, or in any other way, and so prevent the development of various forms of inflammation in the breast itself. The application of carbolic acid is not nearly so painful as that of nitrate of silver, and a cure is obtained more quickly with the former than the latter drug. A strong 5 per cent. solution seems to be decidedly more efficacious than a weaker 2 per cent. solution. (*The Medical Times and Gazette*, Vol. ii., 1878, p. 106.)

Cold Water Enemata in Chronic Diarrhœa. — Dr. Messemer has made trial with favourable results of enemata of cold water in cases of chronic diarrhœa. He was led to adopt this method of treatment by the advantages which he found it to possess in cases of dysentery. Dr. Messemer finds that cold water has astringent properties, for its anodyne properties have been long known in relation to dysentery, and that it acts as a protectant to the mucous membrane of the rectum. When slowly injected so as not to excite peristaltic action, cold water will keep the rectum distended and its walls apart, thereby preventing them from mutually irritating each other, as it makes it impossible for them to come in contact until the fluid thus injected is absorbed. In cases of chronic diarrhœa there is no objection to internal treatment being added to the cold water injections, but the diet of the patient is, in aggravated cases, of the utmost importance for obvious reasons, and should be regulated with the greatest care. The author finds that injections of warm water have not the same beneficial effect as cold, for the stools became watery after the injections of warm water had been continued for a day or two. Hence the cold water does not act by simply removing from the bowel the irritating mucus and fæces, since the warm water does this the more effectually. Dr. Messemer injects about a quart of ice-cold water in divided portions after each passage, the exit of the water is brought about by pressure made upon the abdomen. After expulsion of the water the patient is told to inject a small quantity (about half a teacupful) of cold water, so slowly as not to excite peristaltic action. The diet given in one case consisted of milk, brandy, toast, and beef-tea. Ten drops of tincture of opium were given if tenesmus persisted, and bicarbonate of soda was administered internally. (*American Journ. Med. Sci.*, July 1878.)

Foreign Bodies in the Ear.—In a paper read before the Silesian Society, Professor Voltolini shows that foreign bodies after entering the ear, are unable to fall out again, unless they be very small. For the cartilaginous part of the meatus forms at the entrance to the ear an acute angle which is directed forwards, whilst the meatus becomes narrow at its entrance, being wide behind. To effect the extraction of any foreign body which may have become lodged in this position, it is first necessary to straighten the bend, and this is best done by drawing the muscles of the ear outwards, backwards, and upwards. The cuticle of the ear is very thin on the bony part of the meatus, and is moreover very intimately adherent to the periosteum, Professor Voltolini therefore warns the operator against passing any instrument into the ear farther than it can be traced by the eye, since inflammation of the cuticle is in every case periostitis. Foreign bodies may be present in the ear for long periods without apparent injury, or a patient may falsely believe that a foreign body is present in the ear; this is peculiarly liable to happen in certain diseases connected with the ear, such as acute inflammation of the membrana tympani. The various foreign bodies enumerated by the author as being most liable to gain access to the external auditory meatus, are somewhat curious, for he states that beetles and bluebottles, the latter entering for the purpose of laying their eggs, in which case the meatus is wholly filled with a thriving colony of maggots, are not unusually present. After killing the animals by pouring in the nearest liquid at hand,—oil serving the purpose best—it is recommended that the ear should be syringed out with cold or tepid water, after rendering the meatus straight, by pulling on the muscles of the ear; in this way many foreign bodies may be extracted. In the case of heavy bodies such as shot or stones, the patient is to be laid horizontally with the head hanging over behind, as on a sofa or table, the syringe should then be employed, and the substance will roll out. Foreign bodies which swell up in the ear are treated with the galvano-caustic; fine points being introduced, a hole is gradually burnt into the body, which then breaks up and is readily removed; should no battery be available, the swollen body is allowed to remain untouched, cold injections and external applications being alone recommended. (*Deutsche med. Woch.*, May 25, 1878.)

Treatment of Rheumatic Facial Paralysis by Galvanism.—Dr. J. Mascarel alleges that he obtains much success from the following method of treating rheumatic paralysis of the facial nerve. On the first day he introduced a platinum needle, a centimetre or a centimetre and a half ($\frac{4}{10}$ths or $\frac{6}{10}$ths of an inch) in the direction of the stylo-mastoid foramen, towards the exit of the facial nerve from the cranium. A second platinum needle is placed horizontally in front of the orbit on the paralysed side, in the superior fibres of the orbicularis palpebrarum. The needles are then connected with the poles of a battery of the desired intensity, and an interrupted current passed during twelve, eighteen, or twenty minutes. Violent contractions are caused by this plan, almost convulsive in the orbicularis palpebrarum, and sometimes the eyelids are closed at the first sitting. The second day, this operation is repeated with the palpebral needle below the eye. On the third, fourth, fifth, and sixth days, the facial needle is successively introduced into those muscles of the face which prove most refractory, the other needle is always kept near the stylo-mastoid foramen. After the seventh or eighth day of this treatment, the paralysis had disappeared in a dozen successive cases. (*London Medical Record*, May 1878.)

Notes and Queries.

Wyeth's Dialysed Iron.—We have received from Messrs. Burroughs & Co. a specimen of a solution of dialysed iron, which appears to us to be a very satisfactory preparation indeed, as good as, if not better than that of Bravais, and much less expensive. Dialysed iron is made by precipitating ferric chloride with dilute ammonia, washing the precipitate of ferric hydrate, and dissolving it in the solution of ferric chloride, and placing the mixture in a dialyser. Theoretical objections have been raised to administering iron in this form, as it has been supposed that it would not pass through, and would not be absorbed, but we believe that these objections have little or no practical foundation, and we regard the dialysed iron as a valuable hæmatinic. It is readily borne by delicate patients, with whom other preparations disagree, and the solution now before us has been employed with great effect by Professor Da Costa as a subcutaneous injection in anæmia, and without its use being accompanied by the slightest bad effect, either local or general.

Wyeth's Compressed Tablets.—We have received from the same firm compressed tablets of chlorate of potash, bi-carbonate of soda, bi-carbonate of potash, and chloride of ammonium. These are very small lozenges of the substances just named, made by subjecting them to powerful pressure.

The form of the lozenges of bi-carbonate of potash and soda renders them exceedingly convenient for persons suffering from dyspepsia. The chloride of ammonium is intended for use in sore throat and bronchitis, attended by an abundant secretion of thick and tough mucus, the chlorate of potash for hoarseness, bronchial irritation, and sore throat and mouth. We have tried them with very satisfactory results in cases of irritable throats in gouty persons.

Parker's Paper Lint.—This article sent to us by Messrs. Burroughs, seems likely, if we may judge from the testimony of the American surgeons who have already used it, to be a useful substitute for the lint now generally employed.

GROSVENOR'S BELLADONNA PLASTER.—This has also been sent to us by Messrs. Burroughs. The advantage which it seems to possess over the ordinary plaster is its greater lightness, cleanliness, and adhesiveness, due to the admixture of a small quantity of india-rubber.

EXTRACT OF MEAT CHOCOLATE.—We have received from Mr. Van Abbott some chocolate containing extract of meat, and made up, both in cakes for use in the ordinary way, and in lozenges. The addition of extract of meat does in the very least impair the flavour of the chocolate, while it adds to its stimulating power. The specimen which we have received is of excellent quality, and we should say that a cup of it, with a biscuit or a piece of bread, is likely to be very useful for phthisical or debilitated patients who require something in the forenoon.

Department of Public Health.

INFECTION CONSIDERED FROM A DARWINIAN POINT OF VIEW.

In his *American Addresses* Professor Huxley strongly urged the study of biology on all who intended to devote themselves to the practice of medicine, and he expressed the opinion that by means of it the theory of infectious disease was already being elucidated. The work done by Professor Burdon-Sanderson, by Dr. Klein, and others, has clearly tended in this direction; and in the Address which Dr. Wm. Roberts, F.R.S., delivered before the British Medical Association in 1877, the occurrence of septicæmia, as well as some of the infectious fevers, was regarded as in all probability due to a process of evolution. In the June number of the *Practitioner* we published a paper read before the Epidemiological Society, in which Dr. Thorne Thorne gave an account of certain facts relating to diphtheria which he regarded as justifying the view, that the property of infectiveness could be developed by a process of evolution in an already existing organism. At the November meeting of the same society this idea was elaborated in a highly interesting paper, by Dr. Hubert Airy, M.A., entitled "Infection considered from a Darwinian Point of View." We are unable to reproduce the paper in its entirety, but by somewhat copious extracts from it we shall be able to convey the principal views embodied in it.

Referring to the "striking idea of the progressive development of infectiveness," suggested in Dr. Thorne's paper, Dr. Airy proceeds:—

". . . . The idea of gradual development of a specific infectious disease within the limits of a single epidemic is an idea which possesses especial importance in relation to biological opinions which prevail at the present day. Twenty years ago the very words in which the idea is couched would perhaps have been hardly understood. In the present day we are at least familiar with the words 'development' and 'evolution,' and there is no doubt that the ideas which those words convey have in recent years acquired a considerable degree of distinctness and (if I may so say) of organization.

"The genius and labours of Charles Darwin, and the school of biologists of which he is the Grand Master, have brought home to most thoughtful minds the conviction that all forms of life are undergoing slow but perpetual change in coaptation with the perpetual changes of the complex scenery of their existence. We have learnt to recognise that among the progeny of any given organism there is not perfect similarity, but there are minute deviations from a common parental likeness. Of these minute variations some will be of a nature to favour their possessors in the race of life, and slightly improve their chance of arriving at maturity and reproducing their kind. Their progeny will inherit in some measure, and some of them by further variation in the same direction will in some measure extend—the same advantage. In this way, by the slow accumulation of infinitesimal steps, from generation to generation, through the long course of ages, a great change, or several contemporary but divergent changes, will be brought about in the bodily framework of the species; and new and distinct forms will thus be produced, each reproducing its like and deserving, equally with the original form from which they spring, the rank of species.

"These changes cannot be limited to the form and frame alone; they must affect also the several faculties and functions with which the various bodily members are endowed. For example, an organ which in one form can only secrete uric acid may by slow modification acquire in another form the faculty of secreting urea; in different plants the same organs may acquire the faculty of elaborating substances so different from one another as india-rubber and turpentine.

"Thus, taking a broad view of the whole organic empire, as knit together by the tie of consanguinity, we may say that, in order fully to know a given plant or animal, and properly to appreciate the true nature and bearings of any vital process or function, we ought to study it, not by itself alone, nor only in relation to other contemporary forms, but also in relation to its historical development through the long series of ancestral forms that preceded it. . . .

"Now these considerations of historical development apply primarily to organisms in their normal condition of health. But I contend that their application is not limited exclusively to that condition, but extends also, in a modified form, to the whole province of disease. For, with certain forms and faculties of certain organs, there are correlated certain liabilities to disorder of form and function, and such disorder constitutes disease. Variation of form or function must carry with it a corresponding variability of the disorder to which that form or that function is liable; that is to say, there must be variability of disease.

"This very feature must needs constitute one very important element in the rivalry between variant forms. The one which brings with it the least fatal appanage of disease will, so far, have the advantage over its rivals, and be the most likely to survive. There will thus be a kind of natural selection of disease, and a survival of the fittest and least fatal, except so far as the selection may be overruled by the greater relative advantage attaching to some rival variation which is saddled with a more fatal form of disease.

"It might be thought at first that the tendency of the operation of natural selection must necessarily be to eliminate all disease—at any rate all intrinsic disease—in virtue of the better chance of survival enjoyed by individuals not subject to such disease; and this would in all probability be the case if variability in the human system were confined to its susceptibility to disease: but considering that the human system must admit of variation at one and the same time in countless different ways—some profitable, others injurious—it is plain that the relative chance of survival of any modification of the whole system will depend upon the total value, or 'algebraic sum,' of all the constituent elements of that modification; and it may well be that a greater liability to disease in a given modification of the system might be more than counterbalanced by some concurrent advantage gained in another direction.

"Different classes of disease will come within the operation of these causes in different ways, and in different degrees; but none, as far as I can see, are by their nature exempt from liability to change. Idiopathic functional disease differs widely and essentially from the action of poisons introduced from without into the system; but both are liable to be altered by alterations in the structure or functional behaviour of the organs affected. (I only mention these diseases, which at first sight must seem remote from any connection with my subject, in order to exemplify my preliminary contention, that there must be historical development of disease in general.)

"A disease, in short, has a history and a pedigree, and this history and pedigree we ought to know if we are to obtain a full scientific insight into the nature and relations of the disease.

"For this purpose a range of study would be required which could hardly be compassed without the devotion of a lifetime to it. A new science would have to be created—a science of Comparative Pathology, parallel in great measure to the science of Comparative Anatomy. The comparative pathologist should first possess a full knowledge of human pathology in his own country, to enable him to institute a comparison between kindred diseases of human beings in different countries, with especial regard to those races of mankind which exhibit the lowest grade of human development; his study would next extend to the various species of Quadrumana, and thence downward through the whole animal kingdom, embracing even the simplest monads on the very borderland where it is difficult to say whether they partake most of the animal or of the vegetable character. I cannot help thinking that such a study might be expected to throw a light on many of the simple elements of disease, on inflammatory and degenerative changes, on malignant growths and functional aberrations, which might ultimately guide the physician and surgeon to more certain remedies than they yet possess, and might even lead to discoveries which in their nature and importance should be comparable to the immortal discovery of Edward Jenner. . . .

"I come now to consider more particularly the bearing of the Darwinian Theory on a class of diseases to which I have as yet scarcely referred, but which concern us in an especial degree —I mean infectious diseases—diseases which possess (among others) this remarkable property in common, that they are capable of being communicated from one person to another. Let us examine how far and in what way this property of communicability lays these diseases open to the operation of the laws of natural selection and survival of the fittest. And first I observe that, irrespective of any theory as to the nature of infection, there would appear to be *à priori* grounds for believing that in any disease in which a tendency to become infectious is at all possible, that tendency is likely to be developed and intensified in course of time. For if we suppose a community exposed in equal degree to a number of diseases of equal fatality, it is plain that any one of these diseases which has in any appreciable degree the property of infectiveness will attack more persons than a non-infectious disease, and those who contract the disease in a more infectious form will be more likely to transmit it to others. In short, the more infectious the disease becomes, the more numerous will be the persons attacked by it, and the greater (*cæteris paribus*) will be its chance of survival by continued reproduction. I may remark that similar reasoning suggests itself, leading to a similar conclusion, in respect to hereditary disease of not more than the average fatality. In either case, whether of infectious or of hereditary disease, the conditions are practically the same as those of a favoured variation in animal or vegetable life, enabling its possessors to leave more offspring after their own likeness than other less favoured forms.

"I have now to consider certain theories which have been advanced to account for the phenomena of infection, and to ask which of them is most in accordance with the requirements of the law of natural selection,—though to this question I doubt if I shall be able to find an answer.

"For a succinct and impartial account of two theories which may be said to divide pathologists at the present day, on the question of spontaneous origin of infectious disease, I would refer to the paper by Dr. Thorne Thorne, to which I have already alluded.[1] Dr. Thorne weighs the arguments advanced on the one hand in favour of the view 'that no case of infectious disease can arise independently of a prior case of the same disease,' and on the other, in favour of the view 'that some of the diseases in question do at times arise independently of antecedent cases; that they are in fact of spontaneous origin,' and he finally adduces those remarkable facts concerning diphtheria, which incline him (at least in respect of that disease) towards the latter view.

"I think it will be admitted that the diversity of opinion here insisted upon relates not so much to the intimate nature of infection as to the mode and manner of its exhibition. Both sides of the question, as thus opposed, admit of being subdivided on the cross-question of the nature of that which causes infection. Those who maintain that every case of enteric fever is caused by an earlier case of enteric fever may range themselves in two camps—the one holding that the matter which carries the disease is an organism foreign to, but parasitic upon, the human body, and incapable of growth or propagation external to that body; and the other holding that the contagium is the infectious secretion of another human body. By a parallel subdivision, those who hold that a case of enteric fever may occur spontaneously will be divided into two bands—one maintaining that the contagium is a foreign organism, generally parasitic on the human body, but also capable of growth and reproduction in some external nidus, and the other maintaining that the contagium is a depraved secretion of the human body, capable of being produced *de novo* by an intrinsic disease, but also possessing the property of reproducing the same disease when inhaled or imbibed into another body.

"In relation to my present inquiry, as to the part played by natural selection in the development of infectious disease, the more important controversy is that which deals with the intimate nature of the infection-bearing matter. Does a case of infectious disease arise from the reception into the body of a specific living organism? or does it arise from the reception or formation in the body of a certain poisonous secretion? Which are we to adopt—the theory of *contagium vivum,* as championed conspicuously by Dr. William Roberts in his Address to the British Medical Association in August, 1877; or the glandular secretion theory of Dr. Benjamin Richardson, as enunciated in his Address to the Sanitary Congress, at Leamington, in October of the same year? . . .

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[1] See *Practitioner*, June, 1878.

"Taking first the theory of *contagium vivum*—the theory that infectious disease arises from germs of some specific organism received into, and multiplying within, the human body—it is seen at once that we have here a complex problem of natural selection. We are evidently dealing with a case of parasitic adaptation (and nowhere, perhaps, do we find more evidence of adaptable variation than in cases of parasitism.) We are dealing with a case which involves two interdependent variables, man and microzyme. In successive generations of mankind there must be on the whole a tendency towards insusceptibility of fatal infection; that is, of the particular infections that are current at the time; because those individuals who are the least susceptible of infection are on the whole the most likely to leave progeny; and their progeny will probably inherit in greater or less degree the parental immunity. I think we may reasonably suppose that if the morbific organism itself were incapable of variation the human race would by natural selection become proof against infection by that organism, unless with susceptibility to infection there were correlated some contingent advantage relatively more powerful than the risk of a fatal termination of the infectious disease. But if, on the other hand, the contagium is a living organism, depending for its support on human susceptibility, it must itself be capable of variation to match the variability of its human home and food. As the human syncrasy varies in the direction of insusceptibility, so the parasitic microzyme will, step for step, attain new virulence, and as long as there is exposure to the risk of infection; that is, as long as man and microzyme are allowed to meet, I see no possibility of a cessation of the process.

"Yet a compromise between them seems possible. For man the most serious contingency is that the disease may have a fatal termination; for the microzyme it is not of vital importance that its human nidus should perish; and it would seem that natural selection might find its equilibrium (though continually fluctuating), and be fairly satisfied with so much variation on both sides as should leave man susceptible of infection, but not in a fatal degree. For this reason I am unable to agree with Dr. C. Bastian, when he says (in his Introductory Address on 'Epidemic and Specific Contagious Diseases,' delivered at University College, October 2, 1871), 'The fact that the general tendency in the acute specific diseases is undoubtedly towards recovery rather than towards death, speaks strongly against the hypothesis that they are dependent upon the presence of self-multiplying germs within the body. Such germs, when present, would be sure to go on increasing until they brought about the death of their host.' The same argument is used also by Dr. Richardson in his Address above-mentioned.

'This statement appears to me to leave out of account the possibility of such mutual modification as might be brought about by natural selection. In illustration I may refer to the recent terrible fatality of measles when freshly introduced among the Fiji islanders. Their constitution had been formed in the absence of measles, and had not had the opportunity of acquiring a suitably protective modification, and thus a disease which in Europe is comparatively harmless was able to sweep off many hundreds of an unprotected insular race. . . .

"Protection against a given infection in a fatal form could perhaps only be certainly attained in a limited community and after a great length of time. The most recent infections in any community appear to be the most fatal—such as, in Europe, cholera and small-pox—infections to which the constitution of the race has not had time or opportunity to adapt itself. Of nearly all the outbreaks of pestilence which have become historical on account of their virulence and fatality, it has been recorded that they were previously unknown in the districts in which they proved so fatal. . . .

"Natural selection does not appear to forbid the hypothesis that a race of microphytes, bred in some external abode under appropriate conditions of temperature and aliment, might find similar but more favourable conditions in the human body, and might at some period become parasitic therein: it might retain, or it might finally lose, its aptitude for independent existence;

and thus might perhaps be explained and reconciled the opposite views that are held with regard to the possibility of a case of infectious disease arising independently of any antecedent case. Both views might be true: in small-pox, for example, the (assumed) parasite may have wholly lost its independent habit, and may only be capable of transmission from body to body: in diphtheria the morbific agent may be an organism which is capable of leading a lowly and innocent existence in a well of foul water, but, translated by chance to a higher life in the body of man, can develop a malignant disease, with all the appearance of a *de novo* origination.

"The bearing of the Darwinian theory on the problem of infection is fully recognised by Dr. Roberts in his Address to the British Medical Association above referred to. . . .

"'If contagia are organisms,' he says, 'they must necessarily possess the fundamental tendencies and attributes of all organised beings.' Among the most important of these attributes is the capacity for 'variation' or 'sporting.' This capicity is an essential link in the theory of evolution, and Darwin brings forward strong grounds for the belief that variation in plants and animals is not the result of chance or caprice, but is the definite effect of definite (though often quite obscure) causes."

After referring to the tendency of a variation once produced to become permanent, as exemplified by the history of cholera, and to the opinion of Dr. Roberts that this disease may be due to an occasional sport from some Indian saprophyte, Dr. Airy proceeds :—

"A similar explanation is suggested by Dr. Thorne, of the facts concerning diphtheria which led him to the conception of 'progressive development of infectiveness.' He found within the limits of a brief and local outbreak cases of simple inflammation of the throat leading by transmission through other persons to cases of well-marked and severe diphtheria ; and great care having been taken to exclude possible fallacies in the investigation, there is good reason to accept the interpretation which he offers in the phrase above quoted. As to the possible nature of the infective matter itself, he remarks in conclusion: 'If the contagion of the acute specific diseases do, as has been suggested by more than one observer, belong to the vegetable world, I know no grounds for refusing to believe that organisms capable of producing a minor and uncommunicable disease in particular stages of their growth, may, in other stages of their growth, or in the course of their subsequent development, become capable of producing a major disease communicable from person to person ; the affair being essentially one of soil. This is not at all a question of the development of a living organism out of matter independently of antecedent life, but merely the production by means of a process of evolution of that which gives to an already existing organism that property by which it becomes infective, a property which it may perhaps lose directly it is deprived of the circumstances which favoured its development, in much the same way as special characteristics may be artificially developed in higher plant life, and be as easily lost again.'

"These extracts justify me in asserting, as already established, that the theory of evolution has a claim to be referred to, perhaps even invoked as umpire, in the controversy concerning the nature of infection. . . .

"Now let us see whether the glandular theory of contagious disease cannot submit itself to the same arbitrament with equal confidence and with equal success. This theory, as expounded by Dr. Benjamin Richardson, is that the matter which produces contagious disease is nothing more than the diseased secretion of one or other of the glands of the human body itself,—that each particle of any one of these poisonous secretions brought into contact either with the blood of the living animal or with certain secretions of the living animal, possesses the property of turning the albuminous part of that same blood or that same secretion into substance like itself. The process of change is catalytic. It is a change by which a body is transformed by the presence of some other body which does not itself undergo change. The multiplication of the poison thus takes place through the force of secretion of the person affected, not through the propagation of germ from germ.

"That some such action does really take place in certain cases appears to be proved by Dr. Richardson's experiments in 1864-5, in which a portion of secreted fluid taken from a patient who was suffering from surgical fever following the operation of ovariotomy, had been made to produce a definite form of fever in an inferior animal by being simply brought into contact with the peritoneal surface of the animal—the phenomena being repeated through four generations of animals. It may certainly be objected that in these experiments the diseased secretion was not administered in the same way as the contagium of an infectious disease, namely, by the lungs or the stomach, but was directly applied to the membrane corresponding to that from which it was derived. It is, however, conceivable that a poison inhaled or imbibed might enter the blood unaltered and be conveyed unaltered to the gland which it had especial power to attack.

"Dr. Richardson instances the poison of any venomous snake as the type of these organisms; and this illustration must go far in support of his view, if there is evidence that that poison is reproduced,—that a person who is poisoned by snake-bite can, by bite or otherwise, poison another person in the same way.

"However, I am not concerned at present to discuss the question on other grounds than those of the Darwinian theory. At first sight it might seem that a mere secretion could give but little scope for the operation of the law of natural selection, but it will be admitted on consideration that any matter which possesses the property—never mind how—of reproducing its like, with possible variations, is *ipso facto* subject to the law of natural selection. That variety which is most certain to reproduce its like,—that shade of secretion which proves most infective,—is most likely to be transmitted and survive; and thus if the first step be granted, that a morbid secretion can in any degree induce a similar morbid action in another body, there is no reason for denying that the process might in time attain the most virulent infectiveness.

"Dr. Richardson himself appears not fully to recognise the possibility of any such modification, when he says (in the Address to which I have before referred): 'Each poison has a specific property, always bringing out the same disease through countless ages. From the time when man was first attacked by them, on to the present time, I have no doubt that each of the communicable diseases has been developed from, and has depended upon, one specific poison.'

"The possibility of the spontaneous origin of an infectious disease is accounted for on the glandular theory by the supposition that 'under certain influences affecting glandular action the poisons may be made to originate directly through nervous impression without the necessary intervention of an infecting particle.'

"That the product of such idiopathic derangement of glandular function should be identical in composition and properties with the product of countless ages of transmitted infection, would be difficult to believe, having regard to the requirements of natural selection, if we supposed the communicability of the disease to depend upon the power of the morbid secretion of one body to alter and assimilate to itself by mere contact the previously healthy secretion of another body, without affecting the function of the gland-cells which produce the secretion. . . . If, however, we might suppose that the foreign particle of morbid secretion alters the character of the secretion which harbours it, by altering the action of the gland,—and if we might suppose that for each gland there is a certain disorder of function into which it was liable to fall either under intrinsic nervous impression or under the contact of foreign morbid secretion,—then we might fairly look for identity of results from these two very dissimilar causes. . . .

"The facts which Dr. Thorne observed in an outbreak of diphtheria, at Llanrhaiadr, were provisionally explained by him in terms of the germ theory. A supporter of the glandular theory, however, would not find it impossible to explain the same facts on his own hypothesis. He would point to Dr. Burdon-Sanderson's experiments (which are quoted by Dr. Thorne) as showing 'that if the exudation of a simple peritonitis be injected fresh into the peritoneum of another animal, the disease assumes a more intense form in the second than in the first; that if in this way the disease be communicated to several animals, the effects will differ in different cases; that if by artificial selection the most severe case be picked out and the exudation from that case be used for further transmission, a still more intense inflammation will be the result, until at last a virus is obtained, of which the virulence resembles that of specific cases of malignant peritonitis in the human subject.'

In these cases, as Dr. Sanderson says, 'the direct intervention of a morbific organism is merely a matter of inference.' But until the presence of such an organism is proved, the champion of the glandular theory has a right to say that the morbid action is caused by the introduced secretion and by nothing else.

"These results of artificial experiment appear to find a striking parallel in the facts of natural development of diphtheritic infection observed by Dr. Thorne, and the same explanation may be given of both.

"It might indeed seem difficult to explain, from the point of view of natural selection, the rapidity of the development of the infective property in these cases. This, however, might depend upon the degree of variability of the gland-function. Where that variability was large, the process of selection would be proportionally rapid. It might even be suggested as conceivable that in a solitary case a morbid change in the secretion, at first innocent, might by gradual self-infection between different parts of the same gland, attain at last to a high pitch of malignity."

Dr. Airy then points to the necessity of looking to experiments in comparative pathology for a more complete understanding of the subject under consideration, and he concludes as follows:—

"I have endeavoured to show that the great law of evolution by natural selection operates in the realm of disease as well as in health: that infectious diseases are doubly subject to its operation; and that, whatever theory we adopt as to the intimate nature of infection, we cannot hope to know its past history or anticipate its tendencies in the future, unless we study it in relation to that grand principle which is paramount through all the phenomena of life."

THE PRACTITIONER.

FEBRUARY, 1879.

Original Communications.

EPILEPSY WITH CARDIAC COMPLICATIONS.[1]

BY W. AINSLIE HOLLIS, M.D.

I AM about to bring before your notice this evening brief notes of five cases of epilepsy. I wish specially to direct your attention to the condition of the circulatory system in each of the cases, a condition which has led me to believe that cardiac complications are more frequently associated with epilepsy than modern treatises on this disease would lead us to expect. There are other matters relating to the phenomena of the fits in some of the patients which I am anxious also to discuss.

CASE I.—Miss X., aged 34, came under my care in November, 1877. Pallid, poorly nourished; intellect feeble; pulse about 90, feeble and very irregular; a blowing systolic murmur heard towards the base of the heart; no increased area of cardiac dulness; general health fairly good; had convulsions whilst teething. For the last five years has had, at frequent intervals, severe fits, accompanied with foaming at mouth, lividity of face, and general convulsive movements of trunk and limbs. There is no premonitory aura. The treatment consisted in careful dietetic arrangements and the exhibition of the following draught:—

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[1] Read before the Brighton Medico-Chirurgical Society.

℞ Sodii Bromidi, gr. xxv.
Træ Cannabis Indicæ, ♏xii.
Aquæ Camphoræ ad f. ℥j. Misce.
Fiat haustus ter in die sumendus.

No fit occurred until the second of last February, an interval considerably longer than usual in her case. On this date, about half an hour after retiring to rest, her attendant, who was an intelligent woman, heard a scream, and found Miss X. in a fit, which lasted a quarter of an hour. The fit, however, was, as the attendant said, "very peculiar"; that is, it differed from any previous attacks she had seen. Miss X. was described as lying upon her back, her face very pale, the teeth clenched, the eyes turned upwards and slightly oscillating, and the arms bent and rigid. Although I was not an eye-witness to this fit, I think the above description may be considered fairly exact. It was obtained by cross-questioning separately the attendant and two other female servants who happened to be spectators of the attack. The appearance of the patient greatly frightened the attendant, who thought she was either dead or rapidly dying; and this attendant, let me remind you, was one who had repeatedly seen her in her previous fits; and was, therefore, not a person likely to be surprised at the ordinary phenomena of epilepsy. I saw the lady next day, and found her suffering from the effects of the attack. She described herself as feeling sore "all over." She had a violent frontal headache, her tongue was swollen and tender, her face very pale, and her pulse was more irregular than usual. I prescribed for her fifteen minims of the tincture of digitalis in place of the Indian hemp in the bromide draught. This latter salt was discontinued (owing to her increasing anæmia, although her pulse was steadier) on March 21st, and an iron and digitalis draught substituted. Five days after the removal of the sodium bromide she had another severe fit, but this time there were the usual lividity of the skin, foaming at the mouth, and violent muscular spasms. I need not take up your time further with this case—merely adding that she is still under treatment, although she has not had a fit for upwards of seven months (November, 1878), and that she is now taking half-drachm doses of sodium bromide, combined with half a grain of bromide of iron, three times daily. Her pulse is now fairly regular and the systolic murmur is no longer to be heard.

Case II.—Henry Stephen H., aged 6, came to the hospital as out-patient, October 23rd, 1878. When a baby, lost the partial use of his left leg, which is at present half an inch shorter than the right. Has been subject to epileptic fits from infancy. Recently he has had an average of two or three daily. Poorly nourished, somewhat pigeon-breasted, fairly intelligent. General health good. In walking he elevates the left knee considerably higher than the right in order that his toes, which hang downwards on that side, owing to some paralysis of the extensor muscles of the foot, may escape the ground. The heart's action irregular. Area of dulness increased upwards over manubrium and to the right. Second sound reduplicated and leathery in character. The fits are accompanied with foaming at the mouth, great pallor of the countenance, and variable muscular spasms.

℞ Sodii Bromidi, gr. x., ex aqua ter quotidie.

October 20th.—Has had two fits since last visit.

Adde haustui Sodii Bromidi, gr. v.

Case III.—Fanny K., aged 12, came as out-patient to the hospital, November 13th, 1878. Fairly well nourished; pale complexion; feeble intellect; general health fairly good; heart's impulse diffused; area of cardiac dulness increased to the right; a musical præsystolic murmur to be heard over the midsternal region; radial pulses very feeble and rapid, that in left wrist almost imperceptible to the touch. Has been subject to epileptic fits for the past eleven years, having had recently as many as seven in one day. She usually falls forwards, occasionally bites her tongue, her face becomes livid, she foams at the mouth, and the left leg is violently flexed. There are slight convulsive movements of the other limbs.

℞ Tincturæ Digitalis, ♏v.
Sodii Bromidii, gr. xx.
Aquæ Camphoræ et Aquæ Distill. āā. f. ℥ss.
Fiat haustus ter in die sumendus.

November 20th and *December 3rd.*—Has had no fits since she has taken the medicine. Pulse in the left wrist rather stronger than it was, but still thread-like in character. Pergat haustua.

CASE IV.—A girl, in service, aged 18, came as out-patient to the hospital last February. Well nourished; intelligent; general health fairly good; pulse small and very irregular; heart's sounds normal in quality; no increased area of cardiac dulness. Whilst in the out-patient room she suddenly fell down in a fit, knocking her head severely against the mantelpiece. Her face was very pale, the eyelids were half closed, and the eyeballs turned upwards and oscillating slightly. Her right arm was flexed and rigid; there were slight muscular spasms of the other limbs. The fit lasted about five minutes. Now this patient had suffered from epileptic attacks for two years past, averaging one in a fortnight; and she had been taking large doses of potassium bromide daily. She stopped in the hospital for two days to recover from the effects of the fall, and I lost sight of her subsequently.

CASE V.—James C., aged 34, formerly an engineer, out-patient at the hospital November 13th, 1878. Fairly well nourished; married; no history of syphilis; had acute rheumatism eight years ago, was in bed for six weeks during the attack; general health good, complains, however, of debility with some dyspnœa upon exertion; heart's action forcible, no murmur; area of cardiac dulness increased to the right; a heaving pulsation observable at the root of the neck; has suffered from epilepsy for the past three years; had many (occasionally thirty) daily fits until his admission to the London Hospital for epilepsy. Was under the treatment of Dr. Hughlings Jackson. He says that the fits were reduced in frequency to an average of one weekly under the influence of considerable doses of belladonna. The fits are accompanied with convulsive muscular movements, foaming at the mouth, and occasionally the tongue is bitten. No aura.

℞ Ferri Bromidi, gr.ss.
Sodii Bromidi, ʒss.
Aquæ Camphoræ, f. ℥j. Misce.

Fiat haustus ter quotidie sumendus.

November 22nd.—Has had five slight fits since last week. A slight one in the out-patient room.

℞ Sodii Bromidi, ʒss.
Træ Belladonnæ, ♏x.
Aquæ Camphoræ, f. ℥j.

Capiat ter in die.

November 29th.—Has had three fits since his last visit.

Adde haustui Træ Belladonnæ, ♏v.

December 6th.—No fit since last visit. Whilst in out-patient room had a fit which lasted two minutes. Face pale; upper extremities convulsed; head turned to the right, neck rigid, and eyelids half open; heart's action very tumultuous during fit; on recovery, right conjunctiva suffused; sight of right eye very much impaired for several minutes; pulse 120, very feeble immediately after fit; ten minutes subsequently 90, volume unequal, improved; great thirst after the attack.

I wish to direct your attention to two special points regarding the history of these five cases: one is the condition of the heart, the other is the peculiar phenomena observable in some of the fits. As regards the heart, we find in all the cases that there were signs of cardiac derangement; although in some, these signs were better marked than in others. In the majority of the cases this derangement showed itself in that rapid and irregular pulse which Dr. Handfield Jones (*Lancet*, February 23rd, 1878) describes as diagnostic of muscular feebleness of the cardiac organ, and the symptoms of which are to be ascertained by tactus eruditus and pulse-tracings rather than by any alteration in the quality of the heart's sounds, or even by the patient's ability to bear exertion. I may say that in all the cases the cardiac symptoms were such as indicated a loss of contractile power in the heart. Notwithstanding, in Case V. there were fairly distinct signs of hypertrophy of the right cavities with dilatation, the symptoms generally would lead me to suppose that the dilatation was not fully compensated by the increased thickness of the ventricular walls. In Case III. the symptoms generally pointed to mitral stenosis with dilatation of the right cavities. In Case II. (in spite of the condition of the chest-walls, well-marked "pigeon breast") I believe that there was probably some dilatation of the right auricle, if not also of the ventricle. The structural changes, if any, in the heart's muscle were slight and not evident in the two other cases, although there were symptoms which indicated (as before stated) considerable muscular feebleness.

Perhaps we may be permitted here to inquire what has induced this condition of the heart in these cases. Are any of the phenomena of epilepsy indicative of strain upon the cardiac muscle? We shall not have far, I think, to search for such indications. During the ordinary epileptic fits we have many proofs that an impediment exists to the passage of blood through the lungs, and that as a consequence it is deficiently aërated during the attack. How this stoppage of the circulation is actually brought about is not clearly understood. In the spasm of the diaphragm, in the energetic muscular movements, and in the almost complete cessation of the respiratory function during a fit, we have, I strongly suspect, a sufficient cause of strain on the right cardiac cavities to account for the symptoms observable in many of the cases that we have just been considering. In Case V., however, there is a clear history of acute rheumatism, which is sufficient in itself to account for the condition of the heart. For this and other reasons I offer the above explanation with great reservation, as my experience on the subject is far too limited at present for me to attempt to found a theory upon it: and I believe that nothing retards the progress of medical science more than theoretical crudities.

I wish now to notice the somewhat unusual and interesting symptoms accompanying some of the epileptic seizures.

Celsus, in his work on Medicine, separates epilepsy into two divisions; in one the fits are associated "*cum distensione nervorum*," in the second they are "*sine illa*" *distensione* (Lib. iii. c. 23). From his own definition of *nervi* (*quos τένοντας Græci appellant*—Lib. viii., c. 1) we learn that this *distensio* must have been a swelling or tenseness of the sinew-like structures of the body. Let us see how this explanation applies to the facts of the case. We all know the usual phenomena of an epileptic seizure. The scream and sudden fall, the complete loss of consciousness, the convulsive muscular spasms, the foaming at the mouth, the absence of free respiratory movements during the attack, and the consequent lividity of the skin and well-marked turgescence of the superficial veins, are facts familiar to us all. Such a keen observer of nature as Celsus was, would assuredly seize upon the most striking of these symptoms in his brief description of a fit. Next to the sudden fall and foaming at the mouth, the most striking phenomena of epilepsy are the muscular spasms and the turgescence of the jugular and other veins of the neck and face. I believe that Celsus pictured in his mind this swelling and tension of the superficial veins (from their resemblance to stretched tendons) in conjunction possibly with the muscular spasms when he associated the seizure "*cum distensione nervorum.*" What, then, is the nature of the fit *sine illa nervorum distensione?* And under what circumstances does it arise? It is to these questions that I shall endeavour to reply to-night. Before, however, making any further observations on the subject I may as well forstall one reply which may come to the lips of some of us here this evening. Celsus could not have meant by his description the so-called "*petit mal*" of us modern physicians. It is evident from what he says further on, that he considered the attack "*sine nervorum distensione*" equally grave with the other, if it was not in his eyes the more severe form of seizure of the two. Thus he tells us to let blood in such cases *without fail:* not necessarily so in the other, wherein purgation and milder remedies can be adopted. I admit, however, that the most heroic remedy which he proposes is considered to be equally valuable in both forms of illness. I allude to sucking up the warm blood as it flows from the severed jugulars of a dying gladiator—a remedy I should have thought more likely to induce the attack than to keep it off!

On a few occasions I have doubtless been an eye-witness to such a fit as Celsus wishes to describe by the negative "*sine.*" I shall, therefore, briefly call your attention to the special peculiarities of these seizures, wherein they differ from the ordinary attacks, the phenomena of which have been already mentioned. The most striking difference in the two kinds of fits, and one which would certainly attract the eye of a careful observer, is the deathlike pallor of the face, the anæmia of the skin in contrast to its turgid lividity during the more usual attack. Another marked peculiarity is the condition of the voluntary muscles; there are seldom any genuine convulsions, none of those violent purposeless movements so distressing to the lay spectator. The slight spasms, which occur in such cases, can only be detected by the oscillations of the eyeballs or some casual twitching of face or limbs. There usually is, however, some rigidity of an arm or leg which relaxes as the fit progresses. The pulse meanwhile is barely perceptible; and the respirations are feeble and irregular. Such are the main features of the attack as witnessed by myself. The sequelæ of the seizure are nearly similar to an ordinary epileptic fit. The patient feels a soreness of the muscles, is dazed or somnolent for a while, may pass a large quantity of urine or flatus after the attack, or may vomit his food. These fits can be distinguished from syncope by their occurrence in the confirmed epileptic in alternation with, or in place of, the usual fits, by the slight muscular spasms and rigidity which accompany them, and by the sequelæ. The entire loss of consciousness readily affords the medical man a means of diagnosis between this attack and hysteria. I do not think it is likely to be confounded with any other nervous affection.

In the cases I have just described, we may venture, I believe, to assume that the muscular feebleness of the cardiac organ was primarily responsible for the pallor of the countenance and the anæmia of the integuments when such symptoms occurred in the fits, although such were frequently absent. On the other hand, I have met with two cases of epilepsy wherein the cardiac affection was wanting, and the patients, nevertheless, occasionally suffered from fits partaking in their character of those seizures which I shall dub for the nonce "syncopal epilepsy."

The practical outcome of the remarks with which I have troubled you is to influence our treatment of the disease. Is it right to administer large doses of potassium bromine in such cases? I consider that we are not justified in doing so when we know that other salts of bromine are available for our requirements. Potash, as you are aware, exerts a powerfully depressant action upon the cardiac muscle, and I scarcely believe that the addition of the bromide diminishes this action greatly. Indeed, an heretical professor of Bonn wishes to attribute the healing virtues of this salt in epilepsy purely to the action of the potash contained in it. Some years ago he assailed me vigorously for presuming to ascribe any value to the sodium bromide in the treatment of this disease. I shall not re-open this controversy, for I believe that even he has repented of the error of his ways. At all events the profession at large continue to prescribe the various bromine salts, and rightly to believe in their extreme value. I am moreover disposed to tax the potassium bromide as being an active accessory to the production of the cardiac feebleness at times observable in this disease. The sodium salt, which I usually prescribe in preference to the other, does not appear to affect the heart in large doses to anything like the same extent. When we obtain evidence by auscultation or otherwise of considerable cardiac debility, I am in the habit of adding small doses of digitalis or of belladonna to the daily draughts. This treatment is very useful in some cases. The anæmia which sometimes marks the long-continued administration of sodium bromide may be advantageously combated by small doses of iron bromide as Dr. Barthelow, of Philadelphia, suggested in his work on Therapeutics. I have found the union of these two drugs especially serviceable in many of these cases.

ON ACUTE BRONCHITIS.

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(*Continued from* p. 22.)

ACUTE CONGESTION OF THE BRONCHI.

Having considered somewhat carefully the process by which the epithelial covering of the mucous membrane of the bronchi is reproduced in the normal condition, we are now prepared to consider the lesions which arise in connection with it. It will be more conducive to the understanding of the catarrhal processes if we first examine what occurs in the bronchus in acute congestion of a mechanical nature. For, although it is somewhat difficult to show where mere mechanical congestion ends and inflammatory congestion begins, or, in fact, to define what the difference between the two is in the early stages, yet we shall consider as mechanical those congestions which do not produce a continuous further change in the bronchial wall, but which, if the cause be removed, tend to resolution; and as inflammatory those which are accompanied by further changes of a secondary nature, resulting in the formation of what we know as inflammatory products. One of the best means of studying acute mechanical congestion in the human bronchi is presented in persons who die from opium-poisoning. The mucous membrane of the bronchi in persons who have met their death by this means is in an acutely congested state, and, as the subject of it has rarely lived beyond a few hours, we can calculate how much change has been produced in a given time. The bronchi also usually contain a considerable quantity of tough glairy mucus, a plug of which will very often be found in the glottis, obstructing it, and probably aiding in bringing about the fatal result. We have examined the bronchi of an otherwise typically healthy subject, aged twenty-five, who died in from ten to sixteen hours, so far as could be ascertained, after an overdose of opium, and found the following appearances:—In the smaller bronchi, which contained either very small cartilages, or none at all, there seemed to be no deviation from the normal state; the mucous membrane and surrounding lung tissue were quite intact, and the layer of columnar epithelium was perfectly preserved. There was, further, no marked congestion of these at the periphery of the lung, and all that was noticed on their free surface was the layer of mucus which is usually seen when they are quite normal. In the larger bronchi, however, an entirely different appearance was noticed, for here the whole bronchial wall, and more especially its inner fibrous coat, was in a state of acute congestion. The small arteries, veins, and capillaries were widely distended, and were all filled with blood corpuscles, and loops of the same could be seen running up to the basement membrane and projecting on its free surface. The latter structure was particularly evident, apparently on account of its having become very œdematous. It was clear and transparent, and was thrown into irregular folds on the surface, apparently from the infiltration of serous fluid into it. The columnar epithelium, here and there, was left unaltered; but throughout the greater extent of the mucosa it had been either partially or completely shed, so that the deeper layers alone were left adherent to the basement membrane. In this manner an extremely demonstrative view could be had of the structures in the deeper layers, for not only was the basement membrane œdematous and particularly easily seen on that account, but the different layers of cells were beautifully isolated on account of their partial desquamation. It might be argued, in opposition to what we have stated, and especially in regard to the cause of the desquamation, that these were, in part, *post-mortem* changes. In order to see what influence *post-mortem* changes might have on the epithelial surface of the bronchial mucosa, we instituted a series of experiments on the subject, with entirely negative results as regards the desquamation of the epithelium, an advanced state of *post-mortem* decomposition having apparently no effect in loosening the attachment of the columnar cells. In one experiment we placed the larger bronchi and part of the surrounding lung substance first in liquor amnii, in which it lay soaking for several days. We then removed it from this, and allowed it to be exposed for about a fortnight, at a warm temperature, until it was in an advanced state of putrefaction. On preparing and cutting this in the same way as the others, notwithstanding the long time which had elapsed since death, and the very trying *post-mortem* conditions under which it was placed, the epithelium was *perfectly preserved in situ,* and not the slightest desquamation of the superficial cells could be perceived. All our other experiments went to confirm this observation, and we shall see that the appearances above described as occurring in this acute congestion of the bronchi in opium-poisoning are also quite characteristic of the commencement of a bronchitis.

At the same time, however, that these changes were taking place in the vessels and epithelium of the mucosa, a further lesion was observed in its fibrous coat. This consisted in the accumulation of small round cellular structures in the interspaces of the fibres, an appearance that we shall have to notice more particularly when we come to examine the lesions in acute and chronic bronchitis. We would therefore conclude that in a typically healthy subject, mere mechanical congestion, lasting only a few hours, is sufficient to give rise to great œdema of the basement membrane, and desquamation of the superficial layer of epithelium covering the larger bronchi. And, further, that coexistent with this there is noticed the accumulation of small round cells in the fibrous coat of the mucosa, apparently due to leucocytes, which had escaped by diapedesis through the dilated wall of the blood-vessels.

ACUTE BRONCHITIS.

From the fact of the mucous membrane of the trachea and larger and smaller bronchi being continuous, and having very much the same structure throughout, it might be expected that a catarrhal affection arising in the one would have a tendency to influence the other. And although, no doubt, this is true to a certain extent, yet it by no means necessarily follows that they are invariably all implicated simultaneously and to the same extent. There are cases, for instance, where we have to do with a limited tracheitis, without the bronchi showing any particular signs of a similar affection; and what is still more usual, the smaller bronchi and air-vesicles may be the seat of extensive catarrh without the largest bronchi and trachea being co-existently implicated. The seat of the disease seems, for some unexplained reason, to be frequently limited to a certain portion of the respiratory mucous membrane, and if it does involve the other portions, only does so in a later stage of the disease, and after the vigour of the inflammatory process has expended itself on the primary seat. We accordingly find that it is almost possible to make a somewhat artificial division, according to the portion of the mucous membrane affected, into tracheo-bronchitis, where the lower part of the trachea and the larger bronchi are the main source of the catarrhal fluid, bronchitis proper, where the medium-sized bronchi are chiefly implicated, and capillary bronchitis where the smallest-sized bronchi are the chosen seat, the last being usually accompanied by more or less acute catarrhal pneumonia, due to the extension of the inflammatory process to the alveolar wall. The first is naturally less dangerous than the other two, and is usually met with in adults: the last, when occurring in children, is an extremely dangerous affection, on account of the narrow calibre and delicate structure of the parts where it has its source, and from the fact that it is always more or less complicated with an acute catarrhal pneumonia.

It is seldom that adults die from an attack of acute bronchitis alone; it is usually where a catarrhal pneumonia has been superadded that it proves fatal and that we have an opportunity of seeing what condition the bronchi are in. If the respiratory passages be examined in such a case, it will be found that the trachea contains a more than usual amount of catarrhal fluid, which has a yellow colour, and is viscid and frequently frothy. In the smaller bronchi the same secretion is noticed, but in greater abundance; and if they be squeezed, a little pellet of this yellow muco-purulent secretion is expressed. The colour of the fluid in the bronchi in such an acute attack, say of ten to fourteen days' duration, is invariably yellow, and of thicker consistence than the normal mucus. It is evident, therefore, that this is not a mere exalted normal secretion, but that it has altered from its usual greyish colour and slightly tenacious consistence, to a yellow, extremely viscid, more purulent-looking material. If the air-vesicles be at the same time involved, that is to say, if there is a concurrent pneumonia, it will be noticed, on looking superficially over the cut surface of the lung, that there are little patches of lung substance every here and there, which are raised slightly, and which are of a somewhat greyish-pink colour. They feel quite soft, and if the finger be rubbed lightly over the surface, they give much the same impression as that of a mass of frog's spawn. When these little masses are squeezed, a quantity of the same muco-purulent fluid exudes either from the cut surface, or from a small bronchus which may happen to communicate with the particular group of air-vesicles implicated. It is clear, therefore, that the whole character of the inflammation, whichever part of the respiratory tract may be affected, is what we understand as catarrhal, in which, instead of there being a solid substance, rich in fibrin, exuded on the surface, as in croupous pneumonia, or croupous bronchitis, there is a fluid secretion, containing instead, a large percentage of mucin; and, further, the mere fact of the constant difference in the character of the morbid product in these two affections would lead us to the *à priori* supposition that they also differed in their manner of formation.

We have examined a great many cases of acute bronchitis arising either idiopathically or as sequelæ to other diseases, more notably measles and whooping-cough, but have found that in the whole of them the appearances are substantially the same; and hence the description of the one will, with a few modifications, correspond to that of the others. We have taken as our model, however, in the following remarks an acute case, occurring in an otherwise healthy youth of nineteen years of age, who died from acute bronchitis, followed by acute catarrhal pneumonia; but it will be understood that the substance of what follows is drawn not merely from this case, but that all the points have been verified in several others. When we cut into such a lung, the bronchi and bronchioles are seen to contain much yellow muco-purulent fluid, which covers the surface of the mucous membrane, and can be pressed out in the form of a tough tenacious pellet. When this muco-purulent secretion is scraped off, what seems most remarkable is the immense congestion of the underlying mucous membrane, whose vessels can be seen ramifying on the surface. When the bronchus is cut across, the outer fibrous coat does not exhibit the same red colour, but contrasts visibly in its somewhat greyish-white glistening appearance with the congested mucosa. The smaller bronchioles may be completely choked up with the muco-purulent discharge, and the whole lung substance intensely congested, especially towards the larger bronchi. When the mucous membrane of the larger bronchi and the cut surface of the lung have been exposed to the atmosphere, the blood which they contain turns to a bright florid red or scarlet hue, differing markedly from what occurs under similar circumstances in mere mechanical hypostasis, where it remains of a more or less purple or brownish-red tint.

In children who die from acute bronchitis the naked-eye appearances are very much the same, with the exception that the bronchial secretion has usually accumulated in larger abundance in the bronchi of small size. All that we learn from the naked-eye examination is, that the mucous membrane is intensely congested, and is covered on the free surface with this muco-purulent secretion. We cannot from such an examination tell what the causes of these appearances are, and therefore require to resort to microscopic examination to make these apparent.

It is always a matter of difficulty in man to get at the first change which ensues in the bronchi in acute catarrh. Most of the cases have advanced beyond this, and it is only by careful selection of certain bronchi that we are enabled to make this evident. On careful comparison, however, of many cases, we feel assured that the first deviation visible is a *relaxation and distension of the abundant plexus of blood-vessels ramifying in the inner fibrous coat*, immediately beneath the basement membrane, that is to say, of the branches of the *bronchial artery*. They become engorged with blood, so that on transverse section they appear like little cavities distended with blood-corpuscles (Fig. 18, *c*). In a few hours afterwards the basement membrane becomes much more apparent than it usually is, and, at the same time, more clear and homogeneous, while the surface is thrown into many folds (Fig. 19, *d*). These changes in the basement membrane are apparently due to its becoming œdematous, serous fluid being infiltrated into it from the underlying plexus of distended vessels; and we shall see that, as the acute irritation continues, this œdematous state of the basement membrane becomes a more and more well-marked feature. The next change, so far as we have been able to calculate, occurs in from twenty to thirty hours after the primary distension of the vessels, and consists in the loosening and desquamation of the columnar epithelium at the foci of greatest congestion (Fig. 19), some of the transitional forms of epithelium seen in the deeper layers being removed at the same time. This desquamation never

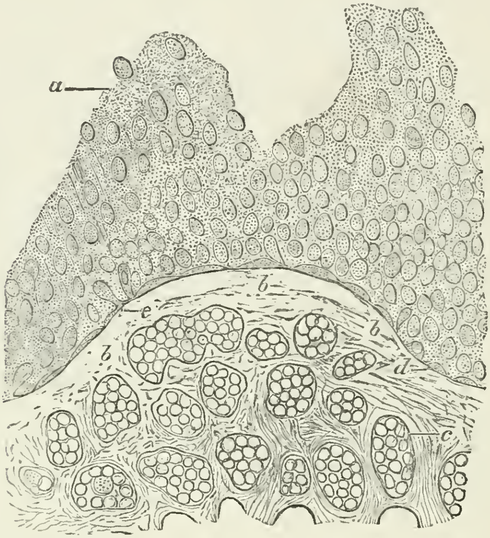

Fig. 18.—Section of part of mucous membrane. Acute bronchitis— × 480 Diams. *a*, catarrhal secretion; *b*, swollen basement membrane; *c*, congested blood-vessels; *d*, flat epithelial cell layer seen on section; *e*, flat epithelial cell layer germinating.

seems to be general, there being usually in a transverse section of a bronchus one or two spots where the epithelium is still adherent. In some instances it takes place to an extreme degree, the whole epithelial covering being apparently detached. This, however, is rare, the columnar cells being those which are usually thrown off, leaving the more or less transitional layers attached. The columnar epithelium is thus shed at a very early stage in the attack, and takes *no part whatever* in the after-changes which ensue. It is never again seen until the other signs of acute inflammation, such as the distension of the vessels and œdema of the basement membrane, have passed off. Subsequently we shall see that it is gradually reproduced. It does not proliferate, there is no endogenous division of its nuclei, and it seems to behave very much in the same way as the *formed* layer of epidermis does in an inflammatory affection of the skin. It merely desquamates, and the only further change noticed in it is of a retrogressive nature, in that it undergoes fatty degeneration. It is, no doubt, partly destroyed by this means and partly expectorated; or some of it is inhaled into the smaller bronchi, where it can frequently be seen lying in large detached masses among the other catarrhal products. When it undergoes fatty

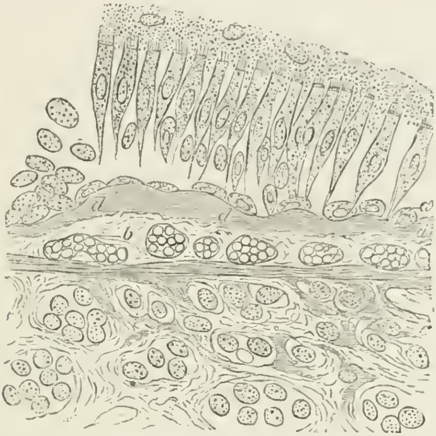

FIG. 19.—Section of small bronchus. Commencing acute bronchitis—× 480 Diams. *a*, flat epithelial cell layer seen on section; *b*, inner fibrous coat; *c*, outer fibrous coat; *d*, basement membrane becoming œdematous.

degeneration, the protoplasm of the cells becomes granular and is resolved into oil globules and protein particles, which are expectorated or absorbed at a later stage of the disease. The fact of its not being reproduced during the course of the catarrhal inflammation corresponds with the clinical observation that *the expectoration in the later stages of acute bronchitis does not contain many columnar cells.* The cause of this desquamation of the columnar epithelium seems to be the œdema of the basement membrane loosening its underlying attachments, very much in the same way as the vesicles which form in an acute inflammatory affection of the skin loosen the attachments of the superficial layers of epidermis. The removal of this protective covering from the mucous membrane naturally leaves the latter in an exposed condition, and no doubt the feeling of rawness experienced in acute catarrh of the bronchi is due to the cold air acting upon an overstimulated and exposed mucous membrane. And, further, it can easily be understood that, where this desquamation takes place to an inordinately great extent, the loss of the ciliary action of the columnar cells will seriously interfere with expectoration, and tend to cause the catarrhal products to gravitate downwards towards the smaller bronchi and air-vesicles. This description essentially coincides with what Socoloff found experimentally in animals (*Virchow's Archiv*, vol. lxviii. p. 611), in which he induced an artificial bronchitis by the injection of irritants, such as potassic bichromate, into the air-passages. He states that one of the first changes which ensued was the desquamation of the columnar cells, and that they took no part in the catarrhal inflammatory process.

(*To be continued.*)

CHLORALISM AND ALCOHOLISM: AND CHLORAL AND BROMIDE OF POTASSIUM.[1]

BY DR. G. DE GORREQUER GRIFFITH,

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ARE these drugs, when given separately—a certain number of hours being allowed to intervene—*antagonistic* in their effect? or are they coadjutors, acting in the *same* way; or, *similarly*, prolonging each other's action; or hastening the soporific effect of each other; or, both alike occasioning a universalisation in the brain of that condition which induces sleep? Is there any centralisation of sleep; that is, is there any particular part of the brain which, when acted on, inducts sleep? or is it necessary for the entire brain to be affected, and brought under the one influence?

These questions have forced themselves on my mind by observing some cases in which chloral given to procure sleep failed altogether, though the doses had been increased, and in which, on laying aside this medicine and substituting the bromide of potassium, that medicated state, which we would term hypnotism, was quickly procured, and natural sleep—that is, without the aid of medicine of any kind—subsequently resulted, to the great refreshment, and more speedy convalescence, of the sick person. In these cases unmistakable symptoms of chloralism were present, yet sleep seemed banished farther and farther the more that medicine was given by itself.

I have often noticed during the administration of chloral—when I have been unable to detect any other anterior effect—

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[1] Read at Harveian Society, Jan. 16, 1879.

that pains in the joints are produced, and by clearing away all other possible causes, and by careful watching in the case of the same patient, also in many other patients taking the medicine, I have been able to trace these pains to the use of this drug, even when the patients in their ignorance, or rather unsuspiciousness of the cause, have constantly affirmed the pains to be only ordinary rheumatic, and such as they had often before endured, an inference on the part of the patient calculated to mislead, and which I believe it has often done.

The pains, unlike true rheumatism, will not be assuaged by the chloral ; on the contrary, when the drug is persevered with, I have found that there will be superadded pains in the thick of the thighs and upper arms, and subsequently in the legs and forearms. These I now invariably term chloral pains, and those in the muscular parts of the limbs will be variously and fancifully described by different patients, and will in some instances be complained of as being excessively severe. The mind at this stage will be found weakened, as is evinced by the person " not being himself at all, and having strange ways about him, and talking strangely," though he may be able to transact his ordinary duties, if they require only little mental attention ; for any great or protracted exertion is quite impossible : if a woman, she may be seemingly capable of executing her usual household matters ; both, however, are uneasy, restless, fidgety ; and on looking closely into the eyes and face there is a peculiar scared, wild look at times, and one as if the person were not looking at you, but beyond you into vacuity, though the eyes are directed straight towards yours. This vacant, what I would term soulless, spiritless look, as if the anima or psyche had left the body, is very characteristic, and always makes me feel as if I were in the presence of a galvanised corpse, or a mere automaton which was being influenced and moved not by its *usual* inherent and, in a manner, understood power, but by an unseen, outside, incomprehensible agency. This very peculiar expression alternates with the usual, or almost usual one. Continuance of the medicine destroys the alternations, and the look of vacuity alone is left. After this, acute delirium will commence if the drug be continued, and the patient—in the lucid intervals that will obtain—will say the head feels enormously enlarged, or, as if it were inflated, or, as though there were no head at all; that the eyes are filled with sand or grit, the eyelids stiff, and as though they could not be closed. These latter eye symptoms may come on early in the use of the chloral; and I have noticed also, in the early stages, contraction of the pupil, dilatation supervening at a later period, if the influence of the medicine be maintained. A choking at the throat, and pain, weight, oppression, and distress at the heart and stomach will be complained of; also that there are pains all over the body, instead of, as before, only in the joints and muscles.

Examining the head visually, the veins will be found full, distended, and well standing out; and, if there be baldness, the scalp may be noticed to be puffy, while to the touch it will be tender, in some cases so much so that the patient will ask you to desist from your examination; the eyelids are swollen, red, and bleared, and, owing to the chemotic condition of the conjunctival lining, induced by the use of the drug, the insides are everted more or less, according to the degree of chemotic tumefaction; the eyeballs are bloodshot; the net of vessels very heavily marked, and, owing to dilatation and engorgement, blood-channels that hitherto—viz., in healthy conditions—have not been visible, are so numerous that the intervening areolæ are very small. Sometimes I have seen this state so bad as to simulate that condition called "Pannus." I have likewise noticed a discharge—purulent looking—occurring from the eyes, and ceasing when the drug is discontinued.

Examination of the throat shows it to share in the congestion, being red, suffused, or even scarlet—conditions which probably exist in the stomach also, and would account for some of the symptoms referable to that organ: the generalisation of the pain, that is, its extension from the joints to the muscles, and in fact "all over the body," as the patients express it (pressure of the painful parts, demonstrating them to be tender likewise) I have attributed to the irritation of the spinal cord, and its subsequent congestion.

In reference to gastric symptoms, I would say that sometimes there is produced a sensation of heat, varying in intensity in different cases; or of weight, oppression, or of burning pain soon after the medicine has been swallowed; while in not a few instances there may occur nausea and emesis, as intolerable as sea-sickness, and attended with giddiness, faintness, imperfection of vision, or even syncope, and that, too, when the head is low; all these being aggravated on assuming any but the recumbent position; indeed, sometimes the very rolling of the head from side to side, or the mere shifting of the body, no matter how slightly, in order to gain ease from existing distress, will make the patient feel as if the room were going round, and will induce this nausea and sickness, at first of the stomach contents; next, if the emesis continue, of bile, and afterwards of gastric fluid, mixed with œsophageal, pharyngeal, and mouth secretions, which are all poured out in increased quantities. After this—as though the secretions were exhausted and dried up—dry retching may supervene, and the train of symptoms will lead the patient, and very often also the medical attendant, to consider it "a bilious attack."

The nausea and sickness may not come on for some hours after the drug has been taken, the patient falling asleep in the interval, and being first attacked when he sits up in the bed or couch after waking, or when he gets out of bed and stands on his feet, the giddiness, the dimness of vision, the swimming of the room, the reeling, the deadly nausea and sickness, setting in one after the other, and generally in the order in which I have written them. These may recur for some successive days, diminishing in severity as time goes on, till they entirely cease; unless they have been mistaken, and the drug, not being suspected of being their producer, has been continued, though perhaps reduced in quantities and longer intervals of administration allowed, its continued use being considered advisable from want of knowledge that the drug is occasioning the very evils we seek to avoid. Or the symptoms may disappear and return when the patient attempts some exertion that has become unusual to him on account of his illness, such as going up and down stairs, playing about the room, or going out for a drive.

As I write these sentences I call to mind some children who were supposed to have incipient hydrocephalus, because of the existence of the symptoms I have just pointed out, because of their persistence (the chloral not having been discontinued), the insomnia, and sluggishness of the bowels, leading astray more completely.

Recognising the source of evil, I was enabled to pronounce a positive diagnosis, and confirm both, by the results achieved on discontinuing the medicine.

I believe, there is at first in the brain, arterial anæmia, next, venous congestion and engorgement leading up to such venous dilatation, as to produce pressure on the brain, the brain substance being compressed between the dilated venous channels, at the same time that its arterial supply is still further diminished by this very venous distension, as well as by the arterial anæmia dependent on the contracted or unfilled condition of the arteries, partly from the effect of the drug on the arteries themselves, and partly because of the reduction of the heart's impulse.

These conditions being prolonged, venous hæmorrhage from rupture of the vessel's coats will occur; or, that condition termed œdema of the brain, the result of exudation of the watery ingredients of the blood, will take place, and will be aggravated by the enfeebled heart action, and the general blood stagnation consequent.

In the primary, or excitement stage, the heart's action will often be found strong and violent, the pulse, unless there be actual countervailing heart and artery disease, being full, strong, with a certain degree of bound and rebound or quick depression, which is, I think, indicative of cardiac muscular weakness induced by the perseverance of the medicine, the vigour of the heart-expulsive power readily giving way to dilation, as if the former could not be sustained but for a very brief period, though it may be quickly repeated to counterbalance the want of the sustaining force. This I have noticed when there was no aortic or valvular mischief, nor indeed any cardiac disease. The sensorium is at this period gravely affected: the patient unable to sleep is constantly talking incoherently, imagining all kinds of absurdities, exceedingly restless, getting in and out of bed, making and unmaking it, and possessed of some of the horrors of the delirium tremens of the drunkard, thinking people are under the bed, or behind screens, or calling from outside the doors: in fact, so nearly are the alcoholic horrors simulated in looks, in gestures, in expressions and words, that before I gained my experience, I used to think the disease to be Alcoholism, even when the patient, and friends, said to the contrary—a statement—in the case of the spirit drinker—unreliable when made by the patient, but often consistent on the part of friends, who cannot always know, how the spirit is obtained, unless the patient be under restraint, and in the care of a personal attendant. The order of the symptoms I have most frequently found to be *insomnia*—though the patient will often complain of being "so sleepy as not to be able to raise his eyelids, and of feeling, in fact, dead asleep." Next *acute mania*, closely resembling that attending delirium tremens, and like it, also accompanied at first with *excitement*, more or less great, and *afterwards* with *intense nervous prostration*, and such *general debility*, that the sufferer will say, "I am scarcely able to move, hardly even to raise my hand." Sometimes there may be no stage of excitement and elevation; or at least it may be so transitory, as barely to be appreciable by the patient, and hardly noticeable by friends and attendants—the second stage (of which I have given the symptoms), coming on rapidly.

Administration of chloral to cure these simulative alcoholism symptoms, supposing we are called in when they are present, and we have not been informed that the person has been taking chloral; *or, continuance of the medicine* when they exist, on the supposition that drink is their origin; or that, even if chloral be the occasion of them, *the pushing of the drug* will cause them to cease—these have, in my experience, aggravated the symptoms, and rendered them sometimes alarming. It was noting carefully the effects of chloral, and accurately tracing and observing chloralism *from its commencement*, that enabled me to find out the real nature of symptoms, even when there was no clue to the imbibition of chloral. One very characteristic difference is, that in alcoholism we find the tongue *dry*, with furs of different kinds, or without fur at all, being red and rasp-like; in chloralism the tongue is soft, moist, flabby, enlarged, and most frequently I have found it, whitish-furred. Constipation, perhaps more usual in alcoholism, yet obtains likewise in chloralism, though it is not so obstinate, nor are the motions so dry; this latter, the drying up of the alvine excretions and secretions, being, I apprehend, a constipatory cause in alcoholism, while in chloralism the paralysing of the intestines is no doubt the occasion.

Noticeably, the skin is dry in alcoholism, whereas it is soft, moist, or even perspiring, under the use of chloral, and warm, at least, in the commencing stages; in the later being cool or cold and clammy; the lips also, being not dry and parched either, but the opposite. The, to my mind, characteristic points of diagnosis, and which may be quickly determined, are the effects of chloral, on the chloral and the alcohol patients, the effects being most pronounced, and usually quickly so. In the thirst and wandering of chloral every fluid is drunk with more or less avidity, there being no cry for ardent spirits, as is the case with the spirit drunkard. No doubt, chemical laboratory examinations of the urine, and other excretions, would demonstrate differentiations, but not having made these, I must be silent regarding them.

If the acute stage be not recognised, the condition becomes as I have before pointed out, one of passive congestion and stagnation.

The head and face gradually become swollen, puffy and purplish, the blueness varying with the degree of congestion; a cold clammy sweat moistens both: and to the touch they are cool or cold; the eyes are prominent, also congested and unmeaning in their expression; and I have seen, in patients suffering from fatty heart cardiac cough and lung congestion, the conjunctivæ of the eyeballs raised into blebs, as if air had been blown under them; moreover, the person complains of the eyes being too big for the head, preventing the closing of the lids; the nose will be pinched, except at the tip, where it will be bluish and swollen, and the alæ will be noticeably moved with the laboured congestive respiratory efforts; the puffy lips are of a blue tinge, as indeed is the entire body, which is cool, and bedewed with cold, clammy perspiration; the pulse may be full; or it may be small, soft, feeble, and compressible, telling of enfeebled heart, and general debility; and the heart-sounds themselves will be found to be soft as though muffled, the contractions and dilations slow and weak; sometimes in the advanced stages I have noticed the heart-sounds to be feeble, heard, as it were, from a distance, the heart-beats being quick, rapid, and irritable, the pulse being a mere thread and expressive of the cardiac and general conditions.

The mind becomes reduced to a state of imbecility, almost to idiocy, and can hardly take in anything, answers being given mechanically to questions neither comprehended nor understood, just as in certain stages of chloroform intoxication. Even at this period the patient may be wakeful; or, if somnolent, be unable to sleep; and, if the medicine be pushed with the hope of procuring it, venous, serous apoplexy may effuse and flood the brain and cord, producing general twitchings, slight convulsive seizures all over the body, there being no violent convulsion, only those tremblings, like the shivering from severe cold; or, complete general paralysis may supervene leading up to life annihilation. The system may be so overpowered as to be made to sleep the sleep of death, the heart-throes, having laboured hard to maintain life, being suddenly stopped; the sudden failure depending, seemingly, on cardiac nerve paralysis.

These are symptoms and effects I have seen occur when the premonitory signs of disagreement were not recognised, and became more and more serious with each additional dose, till at length they culminated in the fatal manner I have endeavoured to pourtray.

They arise soonest, I think, in those cases where there is general obesity and fatty heart; especially if congestion of the lungs, or bronchitis, or pneumonia exist in such conditions; and most quickly, if these ailments involve both lungs. These grave symptoms I have seen attributed to the disease, instead of to the drug, the latter being the real occasion, having been continued when it ought to have been laid aside; its continuance being dependent on the error in diagnosis as to the cause of the grave symptoms, the effects of the drug not being recognised.

Having observed the rapidly dangerous symptoms induced by the administration of this drug in case of fatty heart in which acute double bronchitis had supervened, I employ the medicine with extreme caution, and in aged, or middle-aged persons who have been subject to chronic bronchitis and to which has become superadded an acute attack, I am yet more charily cautious in administering it. I will endeavour now to give you a picture of chloral death, which I once witnessed.

CHLORAL DEATH.

I was hurriedly summoned to visit at the house of Mr. ——, an artist of some eminence. As I entered the room the wife and other relatives surrounded me saying, "We don't know what *is* the matter, doctor; look at him; he does not move; he does not seem to breathe! Is he dead? . . . ." I looked at him as he lay extended at full length on the couch in the most perfect attitude of sweet sleep; every feature, every limb in completest repose—all at rest—his head on the pillow; and above his head his right arm, in the hand of which was still the book he had been reading: the other hand and arm fell over the left side of the couch, just as it had dropped, when the sleep had overcome him: I stooped, raised it; felt the wrist, and bared arm, but there was no pulse; and the touch of the flesh told me that there was an unnatural coolness—the cooling of life into death. I laid the flaccid, powerless arm across the body; and placed my hand over the heart . . . . all was quiet; not a throb beat against the chest . . . . not a sound disturbed the awful stillness, as the wife and friends, holding back their breaths in suspense, while I examined, stilled the stillness yet more—not a breath upheaved the cooling dank breast; not a fibre trilled in that peaceful body . . . . I withdrew my hand gently, and, with my back still turned to the yet hushed mourners, I said, it is all over: he *is* dead. Then, amidst the loud long wail of bereavement, and joy turned into widowhood, the choked sobs and suppressed moans of sorrow, and the whispers of mere acquaintances, I noted the dusky head and face, the closed eyelids and mouth; the purpling lips, and the vein-congested hue of the body generally which, lying at full length, movable in every joint—the death chill having not yet stiffened them—gave the appearance of the most perfect attitude of repose I had ever seen. The artist was himself truly a "dead image," of what he would have so longed faithfully to depict—"dead asleep."

THE PHYSIOLOGICAL ACTIONS OF ACONITE AND ITS ALKALOID.

BY G. HUNTER MACKENZIE, M.D.,

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(*Continued from* p. 195 vol. xx.)

III.—ACTION ON THE HEART.

BÖHM and Wartmann believe that aconite acts on the heart by producing gradual paralysis of the peripheral vagi, for they found the usual symptoms present in aconitized animals after section of that nerve. Achscharumow, from finding section of those nerves followed by an increase in the number of the cardiac pulsations, concludes that in aconitism there is an abnormal inhibition of the cardiac organ. Liegois and Hottot affirm that the drug applied locally to the heart, acts directly on it, and Dr. Milner Fothergill states that it paralyses that viscus in the frog, by arresting the contractions in the diastole. Dr. John Harley asserts that aconite (aconitia), has no direct action on the heart, and that it is only secondarily affected as a consequence of the respiratory difficulty. By Dr. Fleming it is believed that the drug has a direct sedative action on the heart. The general results obtained from the present series of experiments are as follows :—

1. *In the Frog.*—Here the action of the heart is numerically lessened in a space of time proportionate to the largeness of the dose, the subcutaneous injection of one or two minims of the B. P. tincture, diminishing the number of pulsations by about one-half in from twenty to thirty minutes. This effect on the cardiac action is always preceded by a more marked respiratory affection—amounting frequently to complete abolition of the respiratory movement. The heart's action subsequently becomes faint, and then irregular, tumultuous, and intermittent. It may

continue pulsating for hours after all other indications of life have disappeared: during this time the auricles contract with fair regularity, the ventricle very irregularly. It is finally arrested in diastole. On cessation of the contractions. the organ may be incited to renewed action by simply touching, performing artificial respiration, or stimulating in other ways.

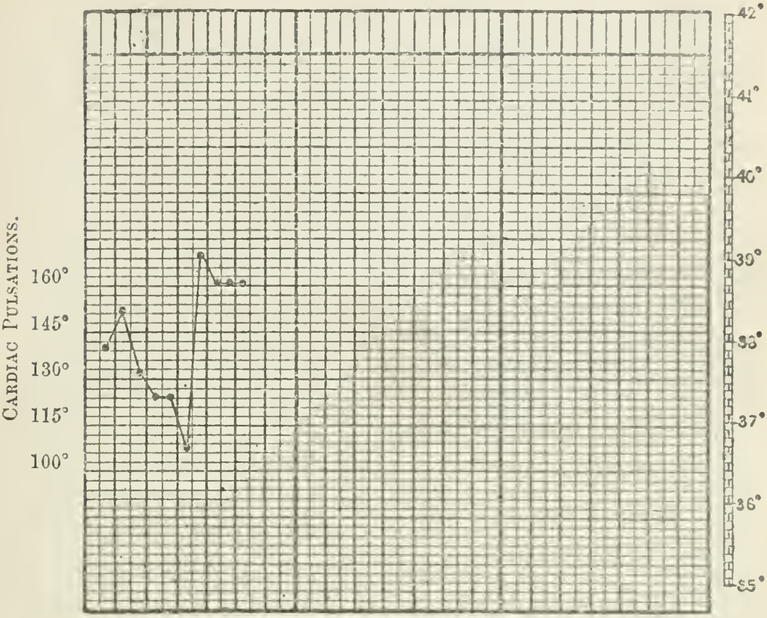
2. *In the Dog.*—In large doses, aconite causes a progressive diminution in the number of the cardiac pulsations, and subsequently renders the action faint, irregular, and intermittent. In very large doses, whilst a fall corresponding to the respiratory fall takes place in the first half-hour or so, as soon as the respiration becomes laboured and spasmodic, with long and impeded inspiration, a temporary rise in the number of cardiac pulsations occurs, the action continuing as before, and the intermittency manifesting itself every third beat. The occurrence of irregularity almost invariably precedes the intermittence, and the heart, whilst it becomes irregular, does not intermit unless the dose be large, though not lethal.

Experiment XXII.—A small frog was poisoned by the subcutaneous injection into its back of $\frac{1}{1000}$th grain of aconite. Four hours and a half from period of injection, and long after the complete cessation of respiration, the thorax was gently opened and the heart exposed. It was found pulsating. The application of a weak galvanic current produced no effect: a stronger one stopped it, but only for a few seconds. The heart was stripped of its pericardial investment, and freely bathed in a watery solution of the tincture of aconite (1 to 2). No effect whatever was produced: it was accordingly next bathed in a solution of Messrs. T. and H. Smith's aconitia (grī. to Aq. ℥īgs.), also without producing any effect. The B. P. tincture was next directly applied, and five minutes afterwards, the diastole was more prolonged, and the systole less firm. These effects disappeared in fifteen minutes, and the heart's action resumed its former characters. It continued pulsating for three quarters of an hour, when the observation was interrupted. When next seen—after an interval of eight hours—it was quiescent, but on slight stimulation by a gentle heat, pulsation recommenced, and continued for ten minutes.

Experiments XXIII. to XXVI.—(*a*.) In a frog poisoned by the subcutaneous injection of 2 minims of the B. P. tincture of aconite, all signs of respiration disappeared five minutes after injection. The heart continued to pulsate regularly for five hours afterwards. (*b.*) In another frog similarly treated, the exposed heart continued to pulsate for 50 minutes after the cessation of respiration. (*c.*) In a cat, weighing 10 lbs. poisoned by the subcutaneous injection of $\frac{1}{90}$ gr. of Smith's aconitia, the heart was distinctly felt pulsating several minutes after the respiratory and other movements had ceased, but on cessation it did not respond to galvanic irritation.

Experiments XXVII. to XXXI.—(*a.*) In a rabbit, weighing 2 lbs. 9 oz. with section of the vagi and killed by the subcutaneous injection of Smith's aconitia, on the cessation of respiration the heart was exposed, and vibratile muscular contractions of that viscus were distinctly observed for ten minutes. On depletion (three quarters of an hour after death) the right side recommenced to pulsate at the rate of 36 per minute : one hour after death, it was still pulsating, and the left ventricle was observed to undergo slight contractions on the application of a gentle heat. The topical application of a solution of aconitia stopped all pulsation. (*b.*) In a rabbit, weighing 3 lbs., poisoned by the subcutaneous injection of $\frac{1}{120}$ gr. Smith's aconitia, death ensued after the usual respiratory symptoms in 27 minutes. On opening the thorax 5 minutes afterwards, the left ventricle was noted contracting at the rate of 48 per minute ; it continued to pulsate for 5 minutes longer. The right side continued to contract for three quarters of an hour : on cessation, it recommenced on the gentle application of heat, but stopped on the topical application of cold water. (*c.*) A rabbit, weighing 2 lbs. 10 oz., received a subcutaneous injection of $\frac{1}{140}$ gr. aconitia. On the heart being exposed after death, and irritated by galvanism, several distinct quivering contractions ensued. (*d.*) Rabbit similarly treated as preceding. After death, the left ventricle was observed distinctly pulsating, and its fibres retracted on section. (*e.*) Rabbit, weighing 2 lbs., poisoned by the subcutaneous injection of $\frac{1}{140} + \frac{1}{60}$ gr. Smith's aconitia. Five minutes after the cessation of respiration, the heart was exposed, and observed contracting at the rate of 40 per minute : 10 minutes afterwards at 16 per minute, the contractions being principally on the right side. It continued to pulsate in this way for 20 minutes, and on cessation it would not respond to galvanism.

FIG. 1.—Physiological Chart, showing the Cardiac Pulsations before and after section of the Vagi, in an Aconitized Rabbit, weighing 2 lbs. 9 oz.



NOTE.—The dark tracing shows the cardiac pulsations *before* section of vagi.

RESULTS OF EXPERIMENT.

1. The subcutaneous injection of a poisonous dose of Aconitia was followed by a slight increase, and subsequently by a rapid decrease, in the number of cardiac pulsations.

2. Section of the vagi was instantly followed by a very great increase in the frequency of the pulsations, which was not markedly diminished before death.

3. The right auricle pulsated for one hour after cessation of respiration, and after venesection.

4. The left ventricle recommenced pulsating slightly one hour after cessation of respiration on being stimulated by heat.

Experiment XXXII.—A chloralized rabbit, weighing 2 lbs. 9 oz. received a subcutaneous injection of $\frac{1}{60}$ gr. aconitia. Eight minutes afterwards the cardiac pulsation had fallen from 140 to 108 : section of both vagi at this period was immediately followed by an increase in the cardiac beats to 170.

Remarks on Experiments.—The preceding experiments, which have been amply confirmed, have been followed by negative results, in so far as they tend to show that the primary action of aconite and its alkaloid is not upon the heart, and that this viscus is only embarrassed as the result of the marked respiratory difficulties. Attention has already been directed to the fact that the peripheral motor branches of the vagus are unaffected in aconitism, and consequently do not abnormally inhibit the heart. In a single experiment, previously referred to, and confirmed on the present occasion, Achscharumow found the cardiac pulsations greatly increased after section of the vagi, and therefore concludes that normal inhibition of the heart was a feature of aconitism. But this is merely the physiological result upon the heart of section of these nerves, and shows that previous to the operation, the inhibitory never had been discharging their normal functions. It will be shown that aconite and aconitia do not produce paralysis of the sympathetic (vaso-motor) nerves, and they do not appear to paralyse the cardiac muscle. Whether the rhythmical action of the viscus is partly interfered with by a paralysant action of the drug on the "sensory" branches of its intrinsic ganglia, in a manner similar to the effect produced on the other sensory nerves of the system, has not been determined.

From the preceding experiments the following deductions may be made:—

1. That in aconitized animals, the heart may be observed pulsating after the abolition of respiration, and death of the animal.

2. That the pulsations of the frog's heart are not stopped by the topical application of a solution of aconitia, or tincture of aconite.

3. That the pulsations of the heart of a rabbit may be arrested on the local application of the tincture of aconite, but as the same result follows the topical application of cold water, it is probably due to the depressant action on the viscus of a fluid, at a temperature greatly below that of the organ.

4. That aconite and aconitia have not been proved to have any direct action on the heart, and only act on it through the medium of the lungs.

(*To be continued.*)

HOT WATER AS A HÆMOSTATIC IN SURGERY.

BY CHARLES B. KEETLEY, F.R.C.S.,

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THAT hot water is a valuable means of stopping certain cases of hæmorrhage is a fact which I have long observed and frequently turned to practical account. At the same time it is a truth universally known that hot water is a valuable aid to increase the flow of blood after venesection. These statements, though apparently opposed to each other, are unquestionably true.

Having had the good fortune to go to an excellent school where hæmorrhagic noses were not infrequent, I first observed its efficacy in many cases of epistaxis, both traumatic and spontaneous. Afterwards, having read a notice of a paper by an American physician (I have unfortunately and ungratefully forgotten his name), stating the *blanching* power of hot water injections into the vagina, I suggested to Mr. Furneaux Jordan that he should use it as a styptic in operating on recto-vaginal fistula. He did so with entire success in a case treated at the Queen's Hospital, Birmingham, in the autumn of 1875. In February, 1876, I wrote to the *British Medical Journal* a short note on the treatment of epistaxis by hot water, which probably attracted no one's attention.

In 1876, Dr. Windelband recommended injections of hot water in cases of uterine hæmorrhage. Temperature of the water should be from 38° to 39° Reaumur, and in severe cases 41° (= 117° to 120°, in severe cases, 124° Fahr.). See *Medical Times*, August, 1876.

Dr. De Mussy has used Dr. Chapman's hot water bags to the spine for the purpose of checking intra-uterine hæmorrhage.

But the first mention which I can discover of the hæmostatic properties of hot water is by Stillé, who, in his *Therapeutics*, recommends it for leech-bites.

On July 3rd, 1878, at the West London Hospital, having amputated a thigh in the upper third, and there being a great deal of oozing from the stump, especially from a quantity of "nævoid" tissue which the knife had divided, I bathed it with cold water for a long time, but without stopping the bleeding. I suddenly drenched the stump with water of a temperature of 120°. All oozing stopped in a few seconds.

In epistaxis, hot water is most effectual when the bleeding comes on during the morning ablution, with cold water, or during the progress of a cold in the head. But it answers frequently in cases of traumatic origin. It should be combined with elevation of at least one hand above the head; but the combination is not essential. The water need only be applied freely to the face, need not be injected into the nostrils. The head should not be bowed down over the basin more than is necessary. Upon two occasions when I injected hot water into the nostrils I dissolved a large teaspoonful of chlorate of potash in a tumbler of hot water, and injected the solution. The saline was used to prevent swelling of the mucous membrane, which so often follows contact with pure water, especially cold water. This hot saline solution stopped the epistaxis instantly.

I must add, in common fairness, that several friends of mine, as well as myself, have found the hot water powerless against epistaxis of a certain grade of severity, and against hæmorrhage from any but quite small vessels.

I could give other cases in which the effect was less evident; *e.g.*, one of bleeding from a wound in the tongue which, after lasting six hours, stopped two minutes after using hot gargles to the mouth. But in this case, styptics, such as Tinct. Ferri Perchlor., had been applied to the tongue only a short time previously, and their action might have been continuing.

How does hot water check hæmorrhage? In the case of epistaxis I believe it acts almost entirely as a derivative. It relieves congestion of the bleeding mucous membrane. In very hot weather, when the warm local bathing threw the patient into a general perspiration, I have known cold water to succeed where hot failed.

But why the direct application of hot water should blanch mucous membranes and sometimes even the surface of wounds, and yet greatly dilate the vascular system in other cases, is difficult to explain. It is worthy of remark that the hands a few minutes after washing in hot water may often be observed to be paler than before. The last phenomenon is not altogether due to the removal of dirt.

On the whole, the most plausible explanation of the hæmostatic action of hot water is that its heat *when sufficient* acts as an excitant to the nerves of the muscular coats of the smaller vessels, and perhaps directly irritates the muscles themselves.

It has been suggested that, when used against post-partum hæmorrhage, the stimulus acts on nerve-centres situated in the substance of the uterus itself. This action may be direct, or it may be reflex, or it may be both.

Hot water should be used in operative surgery. If it be granted that hot water is as effective as, or more effective than, cold as an anti-hæmorrhagic, then I think it ought to be preferred to cold during surgical operations. Surely there are few persons who, witnessing a large amputation of the thigh, for example, have not shuddered to think of the depressing effect upon the patient's vital powers of spongeful after spongeful of ice-cold water drenched over the wide surface of the flaps and stump. There is no class of operations which have so rapidly advanced in point of safety as the class of abdominal sections, and one of the chief precautions acknowledged to be desirable in that class is that the peritoneum shall be kept warm. When this precaution is neglected, it has been remarked that all the blood in the body becomes gradually lowered in temperature as successive portions flow through the exposed and refrigerated intestinal and mesenteric vessels. How much this must increase the depressant action of a serious operation is clear, and for similar reasons the surgeon ought not to chill a stump.

The whole subject is very interesting, alike from physiological, pathological, and therapeutic points of view, and I trust that the above paper tends to show that it is full of promise.

Reviews.

Annual Report of the Postal Microscopical Society, pp. 36. Bath : Culliford and Sons.

THIS pamphlet, besides the report on the financial condition of the Society, contains the address of the President, which is chiefly occupied by directions to the members of the Society regarding the proper discharge of their duties. The object of the Society is to enable persons interested in microscopy, and residing at a distance from large towns, to circulate microscopical slides by post, and to study and discuss them. From the report, it appears that the objects of the Society are becoming more and more appreciated, and the number of members is consequently greatly on the increase.

Clinical Lectures on Diseases of Bone. By C. MACNAMARA, Fel. : Cal. : Univ. : Surgeon to the Westminster Hospital. Macmillan and Co.

THE reputation which Mr. Macnamara gained both as a surgeon and a pathologist during his residence in India will be not only maintained but increased by this volume of clinical lectures; and, although they have been for the most part already published in the weekly journals, he is fully justified in making them more permanently available for reference by issuing them in their present form. That Mr. Macnamara is a cultivated and laborious pathologist is attested by his researches in such difficult questions as tubercle of bone, rickets and mollities ossium, each of which is fully treated in these lectures. Especially interesting are his views on tubercle, and the form in which they are laid before his audience is a model of class-instruction. Commencing with a carefully gathered history of the patient, and a clear description of his symptoms, the lecturer proceeds to develop the pathology and morbid anatomy of the disease, by previous reference to museum specimens, prepared with all the advantages of minute injections, staining, &c. We think his argument in favour of a deposit of tubercle in bone is weighty and logical, and that his specimens throw much light on this long disputed question in pathology. The author ranks himself with those who believe that chronic bone and joint diseases are very commonly strumous in their nature: and he quotes, apparently with approval, the somewhat too sweeping dictum of Professor Gross, that "hip disease could not occur in any man, woman, or child, unless a tuberculous diathesis were present." It is, however, remarkable how strongly the opinion as to the constitutional origin of these affections is now maintained by many of the chief authorities of the day. The lecture on rickets is valuable alike for the author's doctrines respecting the morbid anatomy of the affections and for his sound directions as to treatment; albeit they are not always very novel, and are conveyed with a complacent dogmatism which though quite in place in a class room might, perhaps, with advantage have been toned down before the volume made its *début* before a larger audience. In insisting that the chief cause of rickets is the pernicious habit prevalent among highly civilised nations of bringing up children "with the bottle," instead of at the breast, although the natives are in a condition of abject poverty, Mr. Macnamara mentions the striking fact that in India, where breast-nursing is the invariable custom, rickets is unknown. How far pathologists will agree with the author that hyperosteosis such as was present in Sir James Paget's case (*Med. Chi. Jour.*, Vol. lx.) is really dependent on diffused sarcoma of bone we cannot tell, but the evidence which he advances in the work before us is certainly sufficient to outweigh the obvious objections to such a view. The chapters on the development and minute anatomy of bone, on the repair of fractures, and on mollities ossium are all interesting, and though many of the views they expound are as we have said by no means novel, and while there are some to which we could not subscribe, yet they are both well written and instructive. Some very good illustrative woodcuts are introduced. We have no doubt the volume will be popular.

A Practical Introduction to Medical Electricity, with a Compendium of Electrical Treatment. Translated from the French of Dr. Oniums by A. De Watteville, M.A., B.Sc., M.R.C.S. Lond.—London: Lewis, 1878.

How to Use a Galvanic Battery in Medicine and Surgery. By Herbert Tibbits, M.D. London: Churchill, 1877.

Large and small books on medical electricity have so multiplied of late years that it seems fair to ask whether there is really a professional want for any more of them. The subject having been for a long time almost exclusively in the hands of non-medical pretenders, great caution on the part of those amongst our professional brethren who cultivate it as a specialty seems required.

We have, therefore, been pained by Dr. Tibbits's little book quoted above, in which "the Tibbits medical battery," "the Tibbits battery," "the Tibbits induction battery," and "the Tibbits galvano-caustic battery" form, to our taste, a far too prominent feature. We think that, in order to justify the connection of a proper name with a battery, a really new principle must be involved in its construction; and in such legitimate cases it has hitherto been the general custom that the inventor's name was coupled with the invention, not by himself, but by others. Now, on analysing all the various "Tibbits's batteries" paraded by their author, we cannot discover anything particularly novel in any of them. The cell is Leclanché's, the dial and current-reverser resemble greatly those so long used in Foreaux's and Gaiffe's instruments, and the combination of voltaic and induced current was, we believe, Mayer and Meltzer's idea. The modifications introduced by Dr. Tibbits in all these matters appears to us of the most trivial description. Dr. Tibbits speaks of an *innovation* he has made in "limiting the primary coil to its legitimate purpose of induction, and rendering the secondary alone available for application to a patient!" We might just as well call it an innovation to examine the eyes of a patient without the aid of the ophthalmoscope! For it is just in the oldest and most antiquated instruments that only the secondary coil was utilised; and it was Duchenne's merit to draw attention to the differences between the two coils, and render both of them available for practice. We trust that these remarks, which are made in a perfectly friendly spirit, may induce Dr. Tibbits to limit the too frequent occurrence of his own name in his little book, should any further editions of it be called for.

Yet Mr. de Watteville's *Introduction* seems really to supply a want, and is calculated to be exceedingly useful to practitioners who have little time to consult large works and wish a short, clear, and accurate summary of what is known on the subject. It is an exceedingly able *exposé* of the physical questions involved in applying electricity medically, and contains also a number of practical hints which will be found of great advantage to those who intend occupying themselves with the various applications of electricity in general practice.

On Infantile Paralysis, &c. By J. Althaus, M.D., M.R.C.P. (Prize Essay of the Medical Society of London.)

The author, after giving a clear account of the pathological phenomena attending myelitis generally, and a sketch of the anatomy of the anterior cornua, describes the most common form of inflammation in the latter structures, the so-called "infantile paralysis." He states his opinion that certain cases of infantile eclampsia, characterised by a succession of convulsive attacks and hyperpyrexia, are really fatal cases of this disease, for which he adopts the scientific name "poliomyelitis," proposed by Kussmaul, and generally adopted by German writers. A clear account of the post-mortem changes follows, and the method of using the galvanic and faradaic currents in the diagnosis is fully described. The author proposes the convenient expression of "wasting-test," to the electrical reactions of muscles and nerves deprived of the trophic influence of the spinal centres, viz., abolition of farado-contractility in muscle and nerve, abolition of galvano-contractility in nerve, and quantitative as well as qualitative alterations of the same in muscles.

The author then passes to acute poliomyelitis in the adult and gives illustrative cases. After describing shortly the chronic form of this disease, and the form of it known as progressive muscular atrophy, he gives us the results of his extensive experience in the matter of treatment. The routine management of cases of infantile paralysis ends invariably in miserable failure; and though Dr. Althaus in nowise claims infallible success, still his method deserves to be extensively tried. It consists in the repeated injection of ergotine during the acute stage; the exhibition of iodide of potassium and the galvanisation of the cord during the next stage; and when everything is quiescent (*i.e.*, six months or more after the attack) the administration of phosphorised cod-liver oil and electrisation, both central and peripheral. Strychnine injections are useless; but gymnastics, shampooing, and stimulating frictions contribute to the restoration of vitality of the affected limbs.

The same line of treatment is to be adopted in poliomyelitis, acute or chronic, of the adult. As to progressive muscular atrophy, it must yet be counted as one of the "opprobria medicinæ." Electricity and gymnastics alone seem to palliate the evil.

We strongly urge all practitioners who have to grapple with that terrible and but too frequent disease, infantile paralysis, especially in its early stages, to make themselves personally acquainted with Althaus' excellent essay.

School Life in its Influence on Sight and Figure. Two Lectures. By R. LIEBREICH, Consulting Ophthalmic Surgeon of St. Thomas's Hospital. 8vo. pp. 36. London: Churchill.

THE author of this pamphlet is of opinion that both shortsightedness and spinal curvature are developed to a great extent during school life, and have their origin in imperfect lighting of schoolrooms, and the defective construction of the table, and of the forms on which the children sit. To remedy this he has designed seats and forms by the use of which he thinks these diseases may be to a great extent prevented. He also gives in this pamphlet designs of a couch and pillows for those who suffer from predisposition to curvature. Small as the pamphlet is, the importance of the subject, and the recognised authority and wide reputation of the author, render it well worthy of perusal.

Annual Address delivered before the Society of the Alumni of the Medical Department of the University of Pennsylvania. By W. A. B. NORCOM, M.D., of North Carolina. Philadelphia: Collins, 1878.

DR. NORCOM'S address has more than a local interest. It is a strong protest against the defective medical education which, according to his account, is only too prevalent in his country. We are accustomed here in England to complain loudly of the very patent defects in our own educational arrangements, but it would seem that we are in some respects objects of envy to our neighbours across the Atlantic. Dr. Norcom contrasts the curriculum in some of the medical colleges of the United States with that which is the rule in our country. In many the longest term of lectures is scarcely five months, and attendance on only two terms is required for graduation. In some only two sessions of fourteen or sixteen weeks each are required for graduation, and these colleges, too, are situated often in small towns where no hospital advantages can be enjoyed. We are glad that the writer is able to contrast with these the careful and thorough education which the student has now the means of acquiring in the medical department of the University of Pennsylvania.

But the address is still more interesting to us on account of the terms in which the writer refers to the lamented Dr. Anstie, of the beauty of whose character he is full of enthusiastic appreciation. After referring with just admiration to his fearless criticisms as they appeared month by month in the pages of this journal, he adds: "I have introduced Dr. Anstie to show you what he thought of mere authority. I now ask that you will, each one of you, get the number of the *Practitioner* for January, 1876, and read the biographical sketch [1] it contains of him. You will learn from it lessons of great value."

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[1] By Dr. Buzzard.

Clinic of the Month.

Treatment by Bromide of Potassium.—Dr. Highet has succeeded in treating successfully a case of idiopathic tetanus by the administration of bromide of potassium. The patient, a girl of ten years of age, suffered severely from the spasms, there being marked opisthotonus and slight "risus sardonicus." The pulse was 100, temperature 101° F. The bromide of potassium was given persistently every two hours, in doses of ten grains in a little water, whilst at the same time beef-tea and milk were administered as often as possible. On the eighth day of the treatment the girl had so far improved that the bromide was ordered to be given in a twenty-grain dose at night only. Ultimately the patient recovered. Dr. Renton publishes an account of some cases of epilepsy which he has treated with the same remedy. In one case fifteen grains of the bromide were administered thrice daily; this amount was increased subsequently to twenty grains, and ultimately to thirty grains four times a day, with marked improvement in the condition of the patient. In a second case forty grains of bromide of potassium were given thrice daily for a period of three months to a strong lad nineteen years of age. In remarking on the administration of large doses of potassium bromide in these cases, Dr. Renton notices that neither of the patients suffered from any eruption, which has frequently proved annoying where bromide of potassium has had to be continued for any length of time. (*The Glasgow Med. Journ.*, vol. x., No. 12.)

Salicylic Acid in Scarlet Fever and Diphtheria.—Dr. Pownall affirms that salicylic acid is one of the most reliable remedies in the treatment of scarlet fever and diphtheria. He has used with unvarying success for the past three years salicylic acid suspended in mucilage, in both mild and severe forms of scarlet fever, and has seen the throat symptoms and fever speedily abate, and the patients make rapid recoveries. On being called to a case, he administers doses varying from five to ten grains every two hours until the throat symptoms and fever abate. He then finds that children, for whom so little can be done, when the mop or brush has to be applied to the throat, experience no inconvenience in taking this medicine, which, being simply in a state of suspension, has a chance—at least some portion of it—of remaining on the throat and so acting as a topical remedy, whilst the remainder acts as an invaluable antipyretic. The success of Mr. Pownall in cases of scarlet fever has led him to try the same remedy for diphtheria, and he has seen the pellicle broken up and the diphtheritic patch removed in the most marvellous manner. Indeed, since the use of salicylic acid in diphtheria, he states that he has not seen one fatal case, although several were of a very dangerous type. In diphtheria the mode of action is to give the salicylic acid every four hours, and tinctura perchloridi (P. B.) alternately with it. Trusting solely to the salicylic acid, it was found in mild cases to answer every purpose, whilst in more severe cases, accompanied with much debility, there seems to be a tendency for the disease to return on discontinuing the remedy. The iron has been therefore added alternately with the acid as a blood restorer. To prove that iron was not the sole active agent in the cure, Mr. Pownall points to the many failures of iron as a local application in the past treatment of diphtheria, whereas with the salicylic acid treatment the pellicle has not spread under its use in one single case. The form used is ℞ acidi salicylici ʒi. vel. ʒii., syrupi simplicis, ʒiv., mucilaginis tragacanthi ℥i., tinctura aurantii ʒiv., aquæ q. sal. ℥vi., fiat mistura, capiat ʒiv. 2ndis horis. (*The Brit. Med. Journ.*, Dec. 21, 1878.)

Method of Masking the Bitterness of Quinine.—The employment of milk as a vehicle for the administration of quinine is useful as masking the bitterness of that substance. Thus, ·06 gramme of quinine in 30 grammes of milk gives a solution which is scarcely bitter; ·12 gramme in the same quantity of milk allows a slight bitterness to be just perceptible; ·03 gramme of quinine in 60 grammes of milk does not give a disagreeable taste; and the latter quantity of quinine in a glass of milk is scarcely perceptible. This mode of administration is recommended in the case of children. (*La Lancette Belge*, Dec. 15, 1878.)

Discontinuance of Morphia after Prolonged Use.—Dr. Braithwaite records an interesting case occurring in the person of a lady who seven years previously had been led to use hypodermic injections of morphia, suddenly discontinuing its use. Originally resorting to it as a relief from pain due to an affection of the spine, the habit had become confirmed, and the doses had reached the amount of fourteen grains a day. As is usual in such cases, there was lassitude and incapability of action, whether bodily or mental, during the early part of the day, but beyond this no bad effect of any kind was produced. Desiring to be free from the tyranny of the habit, the patient gradually diminished the dose to three-quarters of a grain per diem, gauging the diminution which the system would tolerate by the diarrhœa which invariably occurred when the diminution was too great. When six months advanced in pregnancy, a large abscess formed in consequence of an injection, which was followed by erysipelas. The morphia had to be suddenly and rapidly increased in strength to save her life, and to check the disease, which it did in the most remarkable way. The amount of morphia taken at the confinement amounted to eight grains daily, and a fortnight later it was decided, at the patient's own request, to discontinue the morphia at once and entirely. Constant and indeed incessant vomiting and purging came on next day. The vomiting occurred about every ten minutes, and consisted of a mucoid fluid tinged with bile. The alvine evacuations were similar in appearance, but darker and more tenacious. On the second day the same symptoms persisted, and it was not till the fifth morning that the stomach retained a small piece of bread and about a dessertspoonful of beer, but this was rejected in about half an hour, and appeared to have aggravated the sickness. The patient seemed to be in the greatest danger, but throughout resolutely declined to be injected with morphia. On the tenth day the stomach retained a morsel of fish for a few hours, and after this the improvement was gradual but certain. Relapses have from time to time occurred, and the diarrhœa has become chronic, whilst every fresh exertion causes an exacerbation of it. Dr. Braithwaite therefore concludes that a very gradual diminution of the morphia injected is in such cases preferable to a sudden discontinuance. If, however, from any reason, as the formation of abscesses, it is discontinued suddenly, the symptoms resulting will be incessant vomiting and diarrhœa. The vomiting will subside in a variable period, and the sooner the less the stomach is teased with anything. The diarrhœa, however, will continue for a long period, and is best treated by absolute bodily repose. Neither astringents nor enemata of any kind have any effect in checking it, rather the contrary. An enema of thirty grains of chloral hydrate in an ounce of tepid water at bed-time must be excepted, as this was retained, and proved of service on several occasions. (*The Lancet*, Dec. 21, 1878).

Pyrogallic Acid in Internal Hæmorrhage.—Dr. Vesey has been led to try the effects of pyrogallic acid in the treatment of internal hæmorrhages from noticing its astringent effects when applied locally to the hands. He finds that it is of the greatest use when administered in grain doses in cases of hæmoptysis, and suggests that it might be used in the form of spray. A combination of the remedy with ergot affords a very powerful means of arresting internal hæmorrhage. Pyrogallic acid appears to have the following advantages:—The dose is small; it does not disarrange the stomach in the way that the usual tannic or gallic acid mixtures do; it does not cause vomiting as iron and ergot mixtures; it is easily taken, and has no disagreeable after-taste. It appears to be more rapid and certain than any of the remedies mentioned above, and far surpasses the time-honoured acid infusion of roses or pil. plumbi cum opio. It dissolves readily in water or in spirit. A spirit solution of definite strength affords a convenient and ready method of administration. The grain-doses are given every half hour till the hæmorrhage is arrested, and may then, as a precautionary measure, be ordered every four hours, as long as the expectoration is tinged. (*The Dublin Journ. of Med. Sci.*, Dec. 1878.)

On the Use of Vaselin and Unguentum Vaselini Plumbicum in Skin Diseases.—Professor Kaposi, after stating that all emollient substances hitherto used in diseases of the skin where the epidermis is removed or the surface is sensitive,—as various fatty substances, oils, lard, glycerine, and glycerine of starch, are more or less irritating in most cases—refers to the bland and non-irritating properties of vaseline or petroleum jelly (with this also may be classed ozokerin and unguentum petrolei). These have no tendency to become rancid, and are useful in softening and removing crusts and scales, as in cases of eczema squamosum when the surface is dry and desquamating. He introduces an ointment which promises to prove of great value. This is a modification of Hebra's well-known unguentum diachyli, which is seldom met with properly prepared except at Vienna. This ointment, for which Kaposi proposes the name of Unguentum Vaselini Plumbicum, is made by dissolving and incorporating thoroughly by aid of heat equal parts of lead plaster and vaseline, to which a little oil of bergamotte may be added to scent. It causes no burning sensation on excoriated parts, and is especially available in eczema. It is admitted by Kaposi that the original unguentum diachyli gave rise to unpleasant heat and even acute exacerbations of the eczema, due, he believes, to an evolution of fatty acids from the oil during boiling, and to an imperfect saponification of the oxide of lead. (*Wiener klinische Wochenschrift*, xxviii. 17, 1878; *Edinburgh Med. Journ.*, December, 1878.)

The Treatment of Diphtheria.—Mr. de Berdt Hovell believes that the importance of giving a brisk calomel purge at the outset of diphtheria is not sufficiently recognised and acted upon. Local applications he believes to be useful, whilst the favourable effects of tonic medicines are a strong contrast to the very unfavourable or even disastrous consequences of any contra-stimulant medicine. The necessity for the liberal and frequent administration of nourishment and stimulants is indicated by the great tolerance, or rather capacity, of the system to receive them; but all said and done, we are still fighting with an unseen and treacherous enemy, and are face to face with the fact that, until the expiration of twelve or more days, we are not secure from the fatal effects of a fresh deposit. Following a successful mode of treatment adopted by Mr. John Scott, Mr. Hovell has treated cases of diphtheria by the administration of a mixture of calomel jalap and scammony: when he finds the subsequent course of the disease cut short, whilst the tendency to fresh deposits has been much diminished, and in many cases is wholly prevented. Assuming that diphtheria is a disease of blood-poisoning, Mr. Hovell thinks elimination of the poison should be the first object of the treatment. This elimination is to be effected first through the bowels, secondly through the kidneys; chlorate of potash drinks should be given incessantly. Where the nose is affected, the same solution, or permanganate of potash, should be drawn up frequently through the nostrils so as thoroughly to cleanse them. When the patient is unable to swallow, nutrient enemata should be given four times a day: not too frequently if they are to be retained. For this nothing is better than Dr. Munk's mixture,—a tumblerful of milk gruel, a new-laid egg, and a tablespoonful of brandy. Possibly the adverse effect of depletory treatment has tended to deter from the administration of an aperient, but in this, as in many other instances, debility is a bugbear. In one severe case, three doses of calomel and jalapin had to be administered, each dose being followed by a black draught, and even then it was necessary to add an ounce of castor-oil. The relief was as marked as the amount of aperients required to obtain it. The nourishment, stimulants and tonics, given subsequently seemed to be all the more thankfully received and gratefully recorded. The tendency to rheumatism after even a slight attack of diphtheria should never be lost sight of. (*The Lancet*, December 28, 1878.)

Incontinence of Urine in Children.—Dr. Farquharson read a paper upon this subject before the Harveian Society. After some preliminary remarks on the bearing of incontinence of urine on surgery and obstetric medicine, he referred to the subject under three headings. In some cases this affection is found in children of pale weakly organisation, depressed and languid, and feeling keenly their infirmity. Here, there is no doubt some weakened condition of the sphincter vesicæ, or of the nervous centres in the lumbar cord; and tonic remedies, and more especially small doses of wine, will usually act with excellent effect. Secondly, there are cases of much greater severity, usually dating from a period shortly after birth; and here it is necessary to make a distinction of enuresis by day and that by night, for the latter is much more difficult of cure than the former, and frequently resists all medicinal treatment—departing, if it do so at all, spontaneously, about the period of puberty. The remedies which have been generally spoken of as most deserving of confidence are those which act on unstriped muscular tissue, and of these belladonna is the only one which in the experience of the author has given good results. It is necessary to give full doses, and two ounces have been administered to a boy of seven before success, and even then only temporary success was attained. Ergot has proved disappointing, and santonine has been entirely without influence under the morbid condition. Class three includes those cases which may support the belief that incontinence of urine is truly a neurosis: for here we find this symptom coinciding with, and even alternating with, other nervine lesions. Thus on two occasions it was observed concurrently with eczema, and once a very long-standing case was attacked with chorea, during the continuance of which perfect control over the bladder was regained. Nervine tonics are of little use here: but the careful use of galvanism seems specially indicated, as well as blistering over the fifth lumbar vertebra where modern experiment has shown the motor centre to be situated. The recently proposed plan of excluding meat from the dietary was not found to be of much service, no especial acidity of urine being ever observed to require the counteracting agency of purely non-nitrogenous food. (*The British Medical Journal*, December 28, 1878.)

On the Danger attending the Use of the Stomach-pump.—Sir James Alderson calls attention to the injury which may be done to the internal coats of the stomach by the exhausting power of the stomach-pump. He states that in all cases of soluble poisons the full effect of the stomach-pump may be obtained by the use of a tube used so as to act as a siphon, without any chance of danger to the patient. For this purpose an india-rubber tube with an opening near that extremity of the tube which is to be introduced into the stomach, being carefully passed down the œsophagus, is to be filled with water or some other bland fluid, the other end of the tube—which may be funnel-shaped—being held for the time above the mouth. As soon as the tube is full, pressure is to be rapidly applied to the tube at its upper or outward opening: it is to be pinched quickly between the finger and thumb, and then turned downwards, when, acting as a siphon, it will empty the stomach. This process can be repeated as long as any indications are given that all the poison has not been withdrawn from the stomach. Of course, this only applies to soluble poisons, and in these cases only can such means be judiciously employed. The power of the siphon is not great, but it is sufficient for the occasion and is without danger. This tube answers also the purpose of feeding the insane, provided care be taken to keep the outer opening of the tube well above the mouth of the patient. Gravity will then exercise all the power required for the passage of liquid food into the stomach. (*The Lancet*, January 4, 1879.)

The Double Chloride of Mercury and Sodium for Hypodermic Injection.—Mr. Stern states that the method of treatment which was adopted some years since in cases of syphilis by the employment of corrosive sublimate was inconvenient as causing abscesses and gangrenous spots at the puncture. Numerous attempts have been therefore made to replace the corrosive sublimate by other preparations of mercury. Mr. Stern proposes to make use of a double salt, the chloride of mercury in combination with an excess of chloride of sodium. The solution recommended is bichloride of mercury, ·25 gr.; pure sodium chloride, 2·50 gr.; distilled water 50 grammes. Two grammes a day of this mixture are ordinarily injected, thus giving a dose of 0·01 of the sublimate. Fifty-three patients suffering from syphilis have been treated in this way; and the following results have been obtained. The symptoms of secondary syphilis have disappeared in a comparatively short time, and the remedy is thus of advantage when it is necessary to effect a rapid cure; only small doses of mercury have to be administered; the inflammation at the puncture is inconsiderable; it does not enfeeble the organism to any great extent, and it only causes very slight stomatitis; and lastly it necessitates no alteration in the habits of the patient. (*Le Progrès Médical*, December 21, 1878.)

Treatment of Intussusception of the Bowels in Infants.—Mr. Blaker has successfully treated a case of intussusception in an infant aged seven months, by distending the large intestine with thin gruel, under the influence of chloroform, the administration of the anæsthetic prior to the injection of the fluid appearing to materially promote the successful result, since it allayed the muscular spasm, and prevented any struggling on the part of the child, thereby allowing the treatment to be efficiently carried out. The injection of gruel was administered early, before the intussusception could have extended far, or the invaginated bowel become congested and swollen. The method of treatment consisted simply in placing the child thoroughly under the influence of chloroform, and then raising the nates to a considerable height on a pillow. The position of the child therefore favoured by gravitation the introduction of the fluid. The gruel was then slowly injected by means of a Higginson's syringe, the upper part of the nozzle being pressed firmly against the nates to prevent any fluid from escaping. After a pint or more had been injected, the abdomen became somewhat tense, and the distended bowel could be felt, like a hard rope an inch in diameter, almost as far as the right iliac region, and considerable force would have been required to inject any more of the fluid. When the nozzle of the syringe was removed a portion of the gruel escaped, and soon afterwards a much larger quantity. The child slept at intervals after the injection, and took the breast well, and there was no vomiting or pain. On the following day the tumour which had been previously felt in the abdomen was found to have disappeared, and there was again no symptom of pain or spasm. The child appeared in perfect health, though the motions retained a green and unhealthy appearance until four days after the commencement of the attack. (*The Brit. Med. Journ.*, January 11, 1879.)

On the Use of Chloral in Diphtheria.—Dr. Rokitansky has used a 50 per cent. solution of chloral in three cases of diphtheria, which had resisted the usual remedies, such as salicylic acid, carbolic acid, &c., and every time with the same results. The solution was applied every half hour with a camel's hair brush, and caused very little pain, except in one case where the tongue was thickly covered with a layer of diphtheritic matter; here a very considerable secretion of saliva was always observed immediately after the application, and the pain ceased entirely after a few moments. In the other two patients, in whom both tonsils were partly covered with the diphtheritic membrane, the pain was insignificant.

After the solution had been applied three times, *i.e.* one hour and a half after the first application, large pieces of the membrane could be easily removed with the brush. The underlying position of the mucous membrane was red and covered with fine granulations; as soon as the normal tissue could be seen, weaker solutions of chloral were gradually used during a week, at the end of which the patients had entirely recovered. (*London Med. Record*, December 15, 1878.)

Chloral as a Local Revulsive.—Dr. Peyraud describes the local action of chloral in an article in the *Bulletin de Thérapeutique*. In the case of a patient to whom he applied chloral on cotton-wool to the temple for the relief of neuralgia, a burn of the third degree was formed in thirty or forty minutes. Dr. Peyraud then mixed chloral with gum tragacanth, spread it on paper, and applied it to his own arm. In twelve hours a blister was formed, without any pain: the same result was found in several patients to whom the chloralised paper was applied. The absence of pain depends upon the chloral being mixed as above; if applied in powder, strewed on plaster or cotton-wool. it produces painful burning. The blister does not rise until the chloral plaster has been removed for an hour or more.

Dr. Peyraud also observed evidence that the chloral was absorbed by the skin. After the application, several of the patients fell into a deep sleep; and the same occurred to Dr. Peyraud himself when the surface to which the chloral was applied was external. This hypnotic effect often precedes the revulsive action. The blisters are less distinct the more concentrated the application is; the vesication is less constant than that produced by cantharides. The suppuration lasts about five or seven days. Dr. Peyraud recommends the chloral paper as a mild and painless application. (*London Med. Record*, December 15, 1878.)

On the Use and Application of Iodoform.—Dr. Cottle finds that iodoform when administered internally is not wholly satisfactory, since the improvement in the condition of the patient is not so marked as might have been expected, whilst the distressing effects of iodine are frequently induced; these effects being intense frontal pain, coryza, loss of appetite and sickness, with heightened temperature and quickened pulse. In one case these severe symptoms followed the administration of half a grain, twice daily. As a local application iodoform is exceedingly useful in most forms of ulceration, whether specific or not, in almost any situation. It may be applied with advantage to ulcers of the legs, to rupial sores, buboes that have become open wounds, to ulcerations of the vagina, uterus, &c. The drug has also been highly spoken of as an application in cases of post nasal catarrh, of ulcerations of the throat, of ozæna whether syphilitic or not. As a parasiticide it is serviceable, many cases of tinea tondens, sycosis, &c., improving under its influence. It is also very soothing when used topically to malignant ulcerations. Indolent sinuses may often also be injected advantageously with iodoform. Two points of clinical importance must, however, be borne in mind in the employment of iodoform. Though a local anodyne, it is in some degree an irritant. It should never, therefore, be applied to an inflamed surface, since it is likely to cause irritation and pain. It is to the indolent ulcer in which action is absent or deficient that it acts so beneficially. And again iodoform is apt to inflame the sound skin that surrounds the lesion it is intended to benefit if kept in contact with it for any lengthened period. On ulcers and venereal sores previously cleaned and dried the drug may be lightly dusted, after being finely powdered, a piece of dry lint being laid lightly over it, and the dressing renewed night and morning, whilst the discharge is profuse, though once daily is afterwards sufficient. Tannin or fuller's earth may be mixed with the iodoform in any proportion if it is desired to moderate its action, equal parts of the ingredients being generally prescribed. Iodoform can also be readily by trituration made into an ointment with lard or vaseline or any of the petroleum derivatives, five to twenty grains to an ounce of the base. This mode is especially useful when it is desired to make the application to internal cavities. Iodoform is sparingly soluble in water and glycerine, somewhat more so in alcohol and warm oil, but readily dissolves in ether, and to a still greater degree in chloroform, and it is this property which furnishes the most convenient and easy method of application. A solution of one part of iodoform in six to twelve of either of the last-named bodies is painted with a camel's hair brush over the surface to which it is desired to apply it. The solvent evaporates, leaving a film of iodoform, and in most cases the process should be repeated once or twice daily. To avoid the pain which the evaporation is apt to produce in sensitive parts, such as the nasal fossæ, Dr. Woakes advised iodoformed wool, *i.e.*, finely carded cotton wool with which an equal weight of the drug has been intimately blended. A piece of this medicated wool is to be placed in the required situation and allowed to remain there from one to twenty hours. The extremely penetrating and disagreeable odour of the drug is best prevented by taking great care that none should be dropped upon the clothes of the patient, and by seeing that it is covered over as far as possible after it has been applied. It may be in some degree disguised when made into ointment by prescribing with it some essential oil. Tannin also, when mixed with iodoform, possesses the peculiar property of in some measure removing its odour. (*The Lancet*, January 18, 1879.)

Extracts from British and Foreign Journals.

The Influence of Arsenic upon the Body.—In a paper recently published by C. Gies in the *Archiv für Epcrimentelle Pathologie* (B. vii. p. 175) the results are given of a series of experiments undertaken by him on the effects of the administration of arsenic for a period of four months on pigs, rabbits, and fowls. The quantity given was extremely minute, the rabbits having only 0·0005 to 0·0007 of a gramme, the pigs 0·005 to 0·05, and the fowls 0·001 to 0·008 per diem. In all these animals the weight of the body increased, and the subcutaneous fat was augmented. In young growing animals the bones developed considerably, both in length and in girth, and they presented the peculiarity that wherever in the normal state spongy tissue exists, it was replaced by compact bone. The bones of the carpus and tarsus were in this way converted into solid bony masses. Moreover, just as Weigner found to be the case in animals supplied with small doses of phosphorus in their food, a compact layer of bone was found immediately beneath the epiphysial cartilages of the long bones. This was most distinct beneath the upper epiphysial cartilage of the humerus, and the lower one of the femur, and was apparent after the arsenic had been given for nineteen days, and when only 0·02 to 0·035 gramme had been taken. It was observed that animals fed in the same stable presented the same appearance in the bones, which Gies refers to the air being loaded with the arsenic eliminated by the lungs and skin of the animals to which it was administered, since he found that the changes were also observed in animals kept in a cage, the bottom of which was strewed with arsenic. Besides the changes in the bones, the heart, liver, kidneys, and even the spleen, underwent fatty degeneration. The young of animals fed with arsenic were invariably born dead, though they attained a large size, and presented remarkable hypertrophy of the spleen, and incipient changes in the bones. (*The Lancet*, January 11, 1879.)

Glycosuria and Fatty Degeneration of the Internal Organs after Injury to the Brain.—Dr. Kirnberger contributes the following case:—A clerk, aged 51, who had previously been in good health, fell on the back of his head. After recovery of consciousness twenty-four hours later the patient was found to be blind and to have lost the power of smell, whilst at the same time there was partial paralysis of the left arm and leg, accompanied by a violent headache. On investigation there was found to be a fairly large depression in the occipital bone on the right side, and in the lambdoidal suture. The pulse was slow. The symptoms of paralysis soon disappeared, and the sight improved; though in June, 1875, there was marked hemiopia, so that in both eyes the field of vision on the left side was entirely absent. The patient gradually improved, so as to be able to dispense with medical assistance. At the end of May, 1877, Dr. Kirnberger was again called in, as the patient complained of great œdema of the legs. Examination showed that there was a weak pulse, enlarged heart, a systolic murmur at the apex, and that the second pulmonary sound was slightly marked. The urine was abundant, with a specific gravity of 1010—1012, containing a large quantity of albumin and about 0·5 per cent. of sugar: in the sediment casts, and mucus and epithelial cells were sparingly visible. The appetite of the patient had been large, and he had suffered much from a feeling of thirst. This condition remained unchanged for some time, but from the middle of June there was a marked diminution in the size of the liver, without any accompanying increase of the spleen. On the second of July considerable hæmorrhage from the intestines occurred, and the patient soon died. At the post-mortem a large depression was found on the right parietal and on the right side of the occipital bones, from which a fissure extended across the skull to the left side, and from thence backwards. The dura mater which was adherent had become greatly thickened. In the right occipital fossa was found a large and old apoplectic clot, and on the left side a smaller clot: at the base of the middle portion a third, and a fourth at the anterior portion of the frontal. The optic nerves were slightly atrophied. The heart was hypertrophied; and the valves on the left side were somewhat insufficient. The liver was very fatty: the stomach showed a chronic catarrh; but the mucous membrane of the alimentary tract was otherwise normal. The kidneys were fatty, the pancreas slightly so. The author believes that in this case the increased secretion of urine, and the accompanying degeneration of the renal epithelium, together with the excessive elimination of sugar and albumin, to be the direct consequents of paralysing influences sent down from the nerve-centre along the splanchnics. The diabetes being also an affection of the vaso-motor system. He rejects the theory that the fatty degeneration was due to the increased consumption of sugar, since in this case the urea was not increased, but was in part lessened, whilst the uric acid, which is only present in small quantities in diabetes, was increased, due, in his opinion, to a retardation of the metabolic processes. Dr. Kirnberger believes that there is still another explanation of the phenomena, viz. that the great brain lesion caused a diminution in the nerve-power. The primary cause of the glycosuria and the serious change in the various organs would therefore be the clots in the brain, whilst both would be co-ordinated effects of the lesion to the central nervous system. (*Med. Chir. Rundschau,* June, 1878.)

Treatment of Asthma by Subcutaneous Injection of Arsenic.—Dr. Martelli reports the case of a man, aged 30, who had suffered from repeated attacks of asthma, which were not relieved by various methods of treatment, including subcutaneous injections of strong solutions of morphia. Dr. Martelli employed subcutaneous injections of Fowler's solution of arsenic (one part to two of water.) Two or three syringefuls were injected through the same puncture. The effect was remarkable; the paralysis at once ceased. After two drachms of the arsenical solution had been used the disorder quite disappeared, and the health of the patient improved greatly. Later, there was a return of the asthma, which was subdued by two injections of the solution. The injections were not attended by any troublesome consequences, local or general, beyond pain in the arm of very short duration. (*Gaz. med. Ital.; Lond. Med. Record.*)

Treatment of Sore Nipples.—Dr. Hausmann's plan of treating sore nipples by the application of solutions of carbolic acid has recently been treated in the lying-in wards of the Berlin Charité Hospital. Instead however of applying strips of lint saturated with the solution, Dr. Steiner directed that the acid should be brought into contact with the sores by means of a camel-hair brush. Forty cases have been thus treated with satisfactory results. A 5 per cent. solution seemed to be most efficacious: its application may be said to be painless, as it causes only a very slight burning. By means of the brush the acid can be applied to the smallest cracks, and two or three applications of this kind daily are usually sufficient. A shield of course must be used when the child is put to the breast. Dr. Steiner also tried solutions of thymol, 1 in 1,000, for a similar purpose, but found them to be far less efficacious than the carbolic acid. (*The Medical Examiner,* August 8, 1878.)

Treatment of Chorea.—M. Bouchut gives the following as his treatment at the Hôpital des Enfants maladés. He remarks that there are five kinds of chorea. Its pathology he asserts is a congestive neurosis of the spinal cord. 1. In *chorée vermineuse* he prescribes santonine; should tænia be suspected, he gives male fern, kousso, pomegranate. 2. In *chorée dentaise* when feasible, he removes the supposed offending tooth. 3. In *chorée anæmique des convalescents* ferruginous preparations, quinine, the arseniate of iron and soda, cold baths, &c. 4. In *chorée rheumatismale,* sulphur and other baths, arseniate of soda. 5. In *chorée de cause morale* antispasmodics, isolation, firm authority, dotted cauterization of the spine. 6. In *chorée electrique,* where the affection is partial, limited to a single limb and monoplegic, subcutaneous injections of morphia, and sulphate of eserine, tincture of gelseminen, &c., are recommended. 7. *Indications organiques de la chorée,* that is, lesions resulting from the organic nature of the malady, all remedies which have power to disperse the congestion of the spinal cord; as ether-spray, douches, sulphur baths, vesicatories, cauterization, &c. M. Bouchut prefers dotted cauterization with fusain, and daily hypodermic injections of morphia, or valerianate of ammonia. The drugs he employs are opium, emetics, arseniate of soda, choral hydrate. He lays great stress on procuring sleep, and says that he has made children sleep fifteen and eighteen hours a day for eight and ten consecutive days, by administering chloral to them. After breakfast at eight o'clock he gives forty-five grains of chloral. The child is roused for its dinner, two hours after a similar dose is given; it wakes towards evening, and on being fed enjoys a natural sleep. He has never seen any ill effects from chloral in children, neither gastralgia, vomiting, pyrosis, colic, nor diarrhœa, as often observed in adults. In cases where teeth have to be removed, he gives forty-five grains of chloral to an infant, and the tooth is extracted during the anæsthesia. (*Medical Examiner*, August, 1878.)

Remedies for Mastitis Puerperalis and Sore Nipples.—Dr. Smith recommends as a remedy for mastitis, ℞ linseed oil f. ℥iv. hydrate of chloral ℥ss. Powder the chloral very fine, then mix it thoroughly with the oil. Apply, spread thickly on a piece of soft woollen flannel, a little larger than is necessary to cover the breast, with a central opening through which the nipple may protrude. Apply as warm as can be borne, and keep warm whilst it remains applied by warm sacks of camomile flowers or hops. The plaster should be renewed every four to six hours, until all pain, swelling, and induration are relieved. For excoriated or fissured nipples: ℞ powdered nut-galls, ℥j. oil peppermint gtt. x. comp. tinct. opium q. s. to make a thick paste. Apply a small portion just after the child nurses, each time. Just before the child nurses, the nipple should be gently cleansed with a soft sponge, and warm tar soap-suds. (*Pacific Medical and Surgical Journal.*)

Pilocarpin as an Oxytocic.—Mr. Macan, in reviewing the progress of midwifery, cites cases in which pilocarpin induced premature labour. In one of these cases $\frac{3}{10}$ grain of the substance was injected subcutaneously, followed six hours later by a second dose of the same amount. In order to test the effects of the drug it was used in nine cases of atony of the uterus during the puerperal state. The injections ($\frac{3}{10}$ grain) were made on the third, fourth, and fifth days post-partum. In only three cases however had it any effect on the uterus, and the conclusion is therefore arrived at, that the treatment is worthless in cases of too profuse lochia; whilst the tendency of pilocarpin to interfere with the action of the heart renders it necessary to use the drug with great caution. Two cases of puerperal eclampsia were treated by Dr. Prochownick of Hamburg, by the subcutaneous injection of pilocarpin. The first patient was attacked with violent convulsions eight days before the expected termination of her pregnancy. Before the pilocarpin could be procured she had experienced a second attack, having never regained consciousness after the first. The dose was ·3 of a grain, which was followed in half an hour by profuse sweating and the setting-in of regular labour pains; there were no more convulsions. After a lapse of nine hours convulsions were again threatened, when the pilocarpin injection was repeated, and was followed almost immediately by a fit. In half an hour the patient was again in a profuse sweat, and in an hour and a half she regained consciousness. The labour in the meantime had progressed most rapidly, so that there was no occasion for the use of forceps, the child being born thirty-five minutes after rupture of the membranes. In this case no other treatment was tried except the pilocarpin. The second patient was attacked during her sixth labour, but though she did not regain consciousness after the fit, the child was born without any recurrence of the convulsions. The placenta was retained, and could not be removed even when the woman was fully narcotised, on account of the tetanic contraction of the uterus. During the attempts at its removal the woman had two well-marked fits. The narcosis was then abandoned, and pilocarpin —·3 of a grain—administered subcutaneously. The effect was the same as in the first case. As soon as the perspiration was profuse the uterus relaxed, and the placenta was removed without difficulty; and there were no more convulsions. Dr. Prochownick thinks that besides the rapid and favourable effect of the pilocarpin on the convulsions, it had undoubtedly some effect on the uterus, though whether direct or indirect it is as yet impossible to say. He thinks the dose might without danger be increased to ·46 grain. He prefers pilocarpin to chloroform in the treatment of eclampsia, since the former is more likely to cause regular action of the uterus, and consequently the rapid delivery of the woman with the minimal amount of danger to the child. (*The Dublin Journal of Medical Science,* October, 1878.)

Danger of Atropin.—M. Galezowski at the Séance of the Societé de Biologie of Paris, séance of November 16th, 1878, showed that in many diseases dropping of atropin into the eye was attended with danger. He quoted several cases of adults as well as children in which serious results had followed from absorption by the media of the eye, of very small doses of this substance. In short, Mr. Galezowski believes atropin to be an exceedingly useful, although at the same time very dangerous remedy, which should be used with the greatest caution. Duboisin which can replace atropin is a less dangerous drug, because its principle is less active. (*Le Progrés Medicale,* November 31, 1878.)

Urticaria as a consequent of the administration of Sodium Salicylate.—The following case of urticaria came under the observation of Prof. Leube's *Poliklinik* last winter. A man aged 45, who had been healthy till he came of age, when he suffered from a tedious attack of rheumatism, suffered a relapse and came for advice to the clinic. The left elbow and right knee were slightly swollen, and the skin was somewhat reddened, whilst great pain was experienced in the affected limbs. The heart was normal. The clinical appearance of the disease resembled the usual type, but its course was protracted. During the ten days following admission 0·50 of sodium salicylate were administered every hour, without any good effects becoming apparent, though no signs of any change in the organism were noticed. A large dose of the substance—four grains—was then given by way of experiment. The same evening the patient suffered from an intolerable itching, which came on shortly after injection of the powder, and lay rubbing himself with the woollen bedclothes, though on superficial examination nothing was seen except that the left half of the face, the lower extremities, and a part of the chest were very red : on a closer examination both eyelids, the upper lip, and the lower extremities as far as the middle of the lower part of the thigh, were slightly œdematous. The temperature was 38·8° C. the pulse 90. The urine albuminous. A physical examination afforded no results of importance. The original rheumatism, however, was much improved, as the patient did not feel so much pain in his affected joints. On the following day the temperature in the morning was 37·8 and the pulse 80; in the evening 37·2 and 76: there was no trace of redness. Three days later the patient was free from pain; but on the fourth he suffered so much, that a second large dose of sodium salicylate was ordered. The observations were then made cautiously. Fifteen minutes after injection of four grains of the powder, a burning pain was felt in the forehead, five minutes later great itching of the skin over the right metacarpals. There was slight œdema of both eyelids, and the surrounding parts were somewhat reddened. The redness spread over the left ear to the neck, whilst œdema of the upper lip became apparent. Soon afterwards great itching was felt over the epigastrium, and over the whole abdomen an eruption of pale and sparsely spread vesicles were noticed, situated upon a red ground. Half an hour afterwards the patient felt the itching over the whole of his body, and the vesicles were apparent on his legs, whilst his arms were in a well-marked œdematous condition, without any reddening of the skin. An hour later the vesicles had disappeared, though the reddening of the skin remained apparent for two or three hours. The urine was free from albumin some hours after the attack. On the following day nothing could be seen. Six days afterwards the experiment was again made with similar results. The condition of the patient was always improved, and he continued to take small doses, which were without effect in causing urticaria. After complete recovery of the patient he again took a large dose, followed once more by the appearances described. (Dr. Heinlein, *Aertzliches Intelligenzblatt*, 1878, No. 15., *Med.-Chir., Rundschau*, Oct. 1878.)

Fuchsin in Chronic Nephritis and Dropsy.—Dr. Bouchut communicates the case of a boy aged six years, who had suffered ten months previously from scarlet fever, and who was now ill from severe albuminuria and dropsy. The temperature was 39° C. The child was ordered ·10 fuchsin in two pills and a milk diet, and on the following day 0·15-0·20 grammes of the same drug. The albuminuria and dropsy completely disappeared after fourteen days of this treatment, whilst no bad effects were observed. The author draws no conclusions from this case, but he thinks, and no doubt correctly, that these means ought to be tried in those cases of chronic albuminuria in which other methods of treatment have been adopted ineffectually. (*Gaz. des Hôpitaux*, 1878, No. 43; *Med. Chir., Rundschau*, Oct. 1878.)

Ergotin in Abortion.—Dr. Noel Smith in the course of some remarks upon the treatment of abortion, states that he places great reliance upon hypodermic injections of ergotin in every case of uterine hæmorrhage, during abortion, even though only moderately grave. Small abscesses may sometimes ensue at the seat of puncture, but they are somewhat rare. The formula employed is as follows :—℞ Ergotini gr. ii. 8 pts. vini rect. et glycerinæ āā f. ʒss. M., of which gtt. v. equivalent to gr. $\frac{1}{6}$ of the ergotin are to be injected. (*The New York Medical Record*, July 13, 1878.)

Treatment of Chyluria.—Dr. Ryan has had an opportunity of treating this disease in the person of a native lad. The urine had a specific gravity of 1020, it was of a light cream colour, and deposited a thin coating of red blood-corpuscles on the sides and bottom of the containing vessel. It gave an abundant precipitate amounting to nearly $\frac{7}{10}$ths of its volume on heating, and with nitric acid; it became somewhat opaque on the addition of liquor potassæ, and cleared up completely on adding excess of eth. sulph. Fat globules and altered blood-corpuscles were visible under the microscope. There were renal casts. Beyond an occasional feeling of languor, the patient seemed to experience no symptoms of constitutional disturbance. Mist. creœsoti B. P. ℥i. ter. indie. was ordered, the patient being recommended to abstain as much as possible from fat. The urine rapidly became free from opacity under this treatment, and no trace of albumin could be detected. The creosote was administered with a view to destroy the filariæ sanguinis, which presumably cause this disease, by giving rise to a communication between the lacteals of the intestine and the minute blood-vessels in their neighbourhood. Dr. Ryan states that no inconvenience attends the internal adminstration of creosote, and that it may be given in much larger doses than were employed in this case without producing any ill effects. A superficial microscopic examination of the blood failed to show the presence of filariæ. (*The Indian Med. Gaz.*, Oct. 1878.)

Department of Public Health.

ISOLATION AS A MEANS OF ARRESTING EPIDEMIC DISEASE.

BY EDWARD T. WILSON, M.B. OXON., F.R.C.P.

Abstract of a Paper read before the Health Section of the Social Science Association at Cheltenham, October, 1878.

> *Brut.*—We'll hear no more.—
> Pursue him to the house and pluck him thence;
> Lest his infection, being of a catching nature,
> Spread further.
>
> CORIOLANUS, Act III. Sc. 1.

VARIOUS means have been suggested from time to time for checking the progress or preventing the occurrence of epidemic disease. I propose to deal with one of these, viz., Isolation, or the separation of the sick from the healthy, which is applicable in every case, and in certain diseases, as cholera, diphtheria, and scarlet fever, offers the only safeguard we possess. The neglect of isolation at the present day, and the general ignorance respecting it, is one of those anomalies which abound in our sanitary history—and much must be done in the way of instruction by the Government and by the medical profession before the first principles of the system, on which its success so intimately depends, take root in the public mind. The ruins of lazarettes and pesthouses, in localities where now no means of isolation exist, should remind us that we have gone backward in the matter; and incite us to revive some of the admirable sanitary provisions of Elizabethan times. It may be said, indeed, that this mode of meeting epidemic disease has not escaped the attention of our Government, and that ample powers have been placed in the hands of sanitary authorities for the purpose, but a very slight inquiry will suffice to prove how nugatory a permissive law may be—how stolid the resistance of sanitary bodies to a timid and half-hearted central authority. Here and there medical officers of health and others have thought out the details of isolation for themselves; here and there, at rare intervals, these men have been fortunate in finding sanitary authorities willing, wholly or in part, to carry out their suggestions; but what measure of assistance have they received from Whitehall? Have they not actually been driven, in some instances, *themselves* to pay for local information on essential points? Feeling that a vast mass of information was buried in local reports or remained in the possession of those who had control of isolation hospitals, I determined to communicate directly with the officers of such institutions wherever I could hear of their existence, and the result is a return from 128 hospitals for isolating infectious disease—ninety-seven of these being provided by sanitary authorities for non-paupers, fourteen by the boards of general hospitals, nine built by subscription, three non-pauper hospitals in Scotland, lastly, three pauper hospitals in London and two in the provinces, to which non-paupers are freely admitted. I am of course aware that this list is far from complete, but the difficulties of the inquiry have been considerable. Strange to say, no complete list of hospitals for non-pauper fever cases is in the possession of the Board which presides over the sanitary matters of the kingdom, and I have good reason for believing that much of the information which that Board does possess is inaccurate and perhaps misleading.

To Dr. George Buchanan, to Dr. W. Farr, and to the kindness of personal friends I am indebted for suggestions in aid of my list; but nothing short of a Government inquiry could make it certain that none of the sheds and tenements which pass by the name of fever hospitals have been omitted from the grand total of such institutions.[1]

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[1] In illustration of the difficulties to be contended with I give a list of sanitary districts, which were reported on (what ought to be) reliable authority to be provided with Isolation Hospitals for non-paupers, but which on inquiry were found to have no provision of the kind. Reading,* Maidenhead, Chesterton, Macclesfield, Runcorn, Wirral, Redruth, Barnstaple, Jarrow and Hepburn, Sunderland

Since the year 1866 many "fever hospitals" have been built, for the most part hastily, and during the panic caused by an epidemic of cholera or small-pox. In twenty-five instances this was distinctly stated to have been the case. Everywhere there is apparent a want of method and proportion. Hasty resolves have led too often to wasteful expenditure and only partial success. The principles of isolation are not new and they are extremely simple; whatever may be our belief as to the origin of infection, it is clear that the poison of small-pox, for instance, can be seized upon, surrounded by a sanitary cordon, as it were, and prevented from extending to new ground in the neighbourhood. In the houses of the upper classes, especially in the country, isolation may be fairly carried out; but in towns and villages and in rural districts an isolation hospital offers the only effectual means of separating the sick; lodgings formerly available for this purpose are no longer to be obtained. Regarding the fever hospital, then, from a high sanitary standpoint, it must be acknowledged to be one of the most powerful engines for maintaining the public health. It aims at preventing, not only deaths, but sickness, and the evils it is specially designed to combat are gigantic, for there are at least half a million cases of illness yearly, in England and Wales, from those diseases over which isolation has undoubted control. Objections to the fever hospital, as might be expected, come from local sanitary authorities, and chiefly on the score of expense; it is not easy, however, to understand why a hospital for suppressing preventible disease should not be regarded as equally necessary with a fire engine for putting out fire, or the police for suppressing riot. One of our periodicals recently gave a vivid picture of Captain Shaw, in his office in London, surrounded by wires which communicated with every part of the metropolis; men, horses, and engines ready to dash off at an instant's notice to extinguish the first outburst of flame; and I could not help

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(Port), Dunmow, Epping, Harwich, Witham, Stow-on-the-Wold, Wheatenhurst, Bournemouth, Petersfield, Hereford, Heywood, Liverpool (Port), Morecambe, Withington, Boston, Uxbridge, Frome, Radstock, Taunton,* Bedminster, Handsworth, Tipton, Beccles, Brighton, East Grinstead, Aston, Stratford-on-Avon, Bromsgrove, Dudley, Tenbury, Batley, Wortley.

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* These have Hospitals building but not yet open.

wishing, as I read, that a parallel sketch might some day be possible of the officers presiding over the health of that great city, sitting with ambulances and staff in attendance for the first telegraphic intimation of a case of typhus or small-pox, ready to convey it at once to a place of safety and to stamp out all traces of the disease. That may be in the future, but at the present day a mere reduction in the death-rate from zymotic disease is no mean advantage to a community even on financial grounds, and makes itself felt in increased rents and improved trade. Watering-places should find a direct benefit, in the fact that small-pox, for instance, is removed at once on its discovery, and that infection from that disease is an impossibility. If the same could be said of scarlet fever the town which made the boast would at once outstrip its rivals, as a resort for the young; but even if fair fame is no object, as in some of our large manufacturing centres, it must be remembered that epidemic disease tells directly upon the rates, and that a fever which strikes down the bread-winner of a family, brings with it not only loss of labour, but in the event of death, a permanent charge upon the poor-rate of those who have been dependent upon his work. It is strange that the advantages of isolation have been so long overlooked by the public. Infection spreads by the most unlikely channels, and it is impossible to be armed at all points against it; our water and our milk may be boiled, but who shall guarantee that scarlet fever scales are not sent to us in our newspaper, that fever-stricken children have not been sitting on the clothes sent in by our tailor; or that the tradesman who serves us has not a moment before been at the bedside of an infected child. These are real instances drawn from my own experience. The fever hospital should be no charitable institution, but a powerful weapon in the hands of health officers and medical men, to be used primarily in the interests of the public, and only secondarily, but no less decisively, for the benefit of the patient himself, to whom a roomy and well ventilated ward cannot fail to afford the best possible chances of recovery. Time will not allow of my dealing in this abstract with the various objections, raised against fever hospitals, chiefly on the ground of their danger to the inmates themselves and to the neighbourhoods in which they are placed. I must content myself by saying that these do not appear to be supported by facts, and that isolation has invariably been considered a blessing to the community where it has been thoroughly and intelligently carried out. Who, then, is to provide the fever hospital, and over what areas should its benefits be allowed to extend? To take the latter question first. In the present age of rapid and constant communication no place, however remote, can claim exemption from the attacks of epidemic disease; retired hamlets and isolated cottages, are often the starting-points of the most formidable outbreaks. If, therefore, infection is to be kept in check, there must be means *everywhere* for isolating it, and no cottage in the country should be beyond the reach of such accommodation, should the demands for it unfortunately arise. Distance need not be an insuperable difficulty—still it will be better in sparsely-peopled districts, to have one or two cottages devoted to isolation, than to rely, as is now too often the case, on a large fever hospital, many miles away. It affords a cheap satisfaction no doubt to rural districts, to boast that they are provided with accommodation for infectious diseases, having made arrangements for the reception of cases at a low rate, in the fever hospital, or the fever ward of a general hospital, in some neighbouring town; but this is capable of much abuse, and the Government might do good service by instituting an inquiry, through their inspectors, on the spot, as to the nature and practical sufficiency of the accommodation existing in urban and rural sanitary districts for the isolation of infectious cases. As to the initiative in providing isolation hospitals, there can be no doubt that the sanitary authorities are the proper persons to act, and the expenses should fall upon the rates. Full powers are given by Parliament for this purpose, but no attempt, as far as I am aware, has hitherto been made to ascertain the extent to which these powers have been used.

There are 1614 distinct sanitary authorities in England and Wales (urban 940, rural 585, ports 46, metropolitan 43); yet of these probably no more than 250 or 300 at the very outside are in any way provided with accommodation for isolating infectious disease. In the Appendix at the end of this paper will be found particulars of 116 urban districts (exclusive of London districts, which are said to rely upon Highgate and Islington hospitals), 38 rural districts, and 6 ports which are more or less adequately supplied—and besides these the names of 21 urban districts, 1 rural district, and 1 port, which are credibly reported to have isolation hospitals, but concerning which information has been sought in vain. This gives a total of 183—and the conclusion is obvious that pressure of some kind is needed to urge sanitary bodies to their duty. But even when they are alive to their responsibilities and are anxious to carry out the provisions of the Acts, many difficulties have to be overcome.

It may be that no site can be procured for the building, or objection is made to the cost. Frightened at the large sums paid for hospitals, such as Cheltenham and Bradford, sanitary authorities have been driven to make terms with boards of guardians, and to other expedients still more objectionable. Circumstances differ, however, and each district must look to providing accommodation suited to its special needs. In Cheltenham, with its large proportion of the well-to-do classes, and children of every age brought together for purposes of education, a noble institution, suited in every particular to the requirements of the town, has been erected by the generous gift, in the first instance, of the late Miss Delancey and a few voluntary subscriptions, but chiefly through the munificence of the Rev. J. H. L. Gabell; but such instances must not be used to deter sanitary bodies who are willing to act. At the same time it is important to bear in mind that the main object in view will inevitably be missed by pitching the standard of building too low; for a fever shed, whether of wood or iron, can do only the roughest work of a fever hospital—isolation in such cases is partial, applied only to the poorest, and disease lingers on with fitful outbursts, when it might have been stamped out and destroyed. Misleading ideas respecting the expense of hospitals are arrived at by lumping the whole expense and dividing by the number of beds. I have endeavoured to eliminate one kind of error by asking the cost of building alone, and I find that, roughly speaking, for the average cost of wooden hospitals is 40*l.* per bed; for iron buildings, 48*l.*; for the smaller brick and stone buildings, 49*l.*; for cottages and altered houses, 54*l.*; and for the best brick buildings, 174*l.* per bed. The returns of furnishing from twelve hospitals give a very even average of 12*l.* 10*s.* per bed.

[The paper went on to consider the diseases to be provided for, as well as the class of patients, arguing strongly that if paupers were admitted it should not be as paupers but on an equal footing with the other inmates of the hospital.]

Infection shows no partiality, and the difficulties of proper isolation at home are much the same for both. Luxuries are not looked for at such times, and a clean airy room would, in most cases, satisfy the most fastidious, provided only that it had a homely look instead of the mean and beggarly appearance so characteristic of the present race of fever hospitals. As may be said of the lowest public-house, so is it said of these, that they are open to all classes; it is well known, however, that as regards quite two-thirds of the fever hospitals in England and Wales, no person above the working class would ever be found within their walls.

[Questions of site and style of building, internal arrangements, medical and nursing staff, &c., were then considered; drawings of some of the most recent models, such as Darlington, Folkestone, Warrington, Berkhampstead, and the Oldenburg Hospital at St. Petersburg, being shown in illustration.]

As regards charges, sanitary bodies have, I fear, been slow to see their own interests in this matter, and in too many instances have aimed only at recouping themselves for their outlay, without a thought beyond. The first object of a fever hospital has been ignored, and a prohibitory tariff has left no alternative to the working-man but to remain in his own insanitary home and become a centre of infection, or removal to the workhouse and pauperisation. Like the queen wasp in a garden, the first case of infection must be got hold of, whatever the cost, and from this point of view, self-interest and true economy should suggest the propriety of maintaining, in a large and liberal spirit, all isolated persons who are not well able to support themselves. Any expenditure thus incurred should be regarded as an insurance against the occurrence of epidemic disease. Many sanitary authorities, to their honour be it said, have seen the policy of such a course. No less than nineteen have been reported to me as making no charge except to those who can well afford it, and some pay the wages as well of those who stay away from work on account of the infection in their houses. In Cheltenham, where a hospital unrivalled perhaps in completeness has been built by private munificence without one farthing of cost to the sanitary authorities of the town or neighbourhood, surely a consideration of the expense and trouble which they are spared (for the management is taken off their hands), should induce our town council to act in a liberal spirit towards such poor persons above the pauper class, as may be attacked with infectious disease and consent to be isolated for the public good. My only regret to-day in connection with the Delancey hospital is the fact that free admission is not offered to the poor of Cheltenham and its neighbourhood. It would be a graceful memento of the visit of this influential Association if the town authorities and the public would mark the occasion by instituting a certain number of Congress beds to be free for ever to the infected poor. Many suggestions have been offered for amending the Sanitary Acts which deal with isolation, and notably by Dr. Bond in former communications to this Association, but the time at my disposal does not permit of further allusion to them. . . One legal requirement, however, is of so much importance, in fact so essential to the proper working of a fever hospital, that it must not be omitted—that is, the early and compulsory intimation of infectious disease. The fatal termination of a case is now usually the first warning received by the health officer that infection is at work in his district, and by that time it has probably spread in widening circles, and got almost beyond control. Voluntary information by medical men is not to be expected. They have no right to reveal what their patients would regard as a family secret. To tell it even in confidence to the officer of health might lead to interference which would be resented. Compulsory powers therefore seem demanded, and the responsibility should lie on the occupier or householder, not on the medical attendant.

The complete success of an isolation hospital requires many things which no Acts of Parliament or Local Regulations can supply. Not only must the sanitary authorities and health officers perform their several duties, but it must be done in a kindly and considerate spirit or the public will withhold that support in the absence of which all compulsory clauses are of little avail. The hospital staff and management will require the most minute attention, and so much depends on the support of the medical profession through whose hands the bulk of the patients will pass, that the rules should be such as will meet with their assent and approval. As regards the public, no efforts should be spared to soften and tone down the asperities of hospital life and render isolation more tolerable, otherwise hospitals may be built and large expenses incurred, but the persons for whom they are provided will hold aloof and the plague will not be stayed.

It will be seen then that the isolation system is somewhat complicated, and requires co-operation from such various quarters that one might almost despair of success. A very slight review however of the work actually accomplished by isolation hospitals in England will suffice to reassure any who may have doubt or misgivings, and lead them to consider what might be possible, seeing that with most imperfect materials our health officers and sanitary authorities have been enabled to achieve so much. It is true that some sanitary authorities have kept their hospitals nearly empty, or have even closed them altogether, on the ground that there has been no epidemic and therefore they were not wanted. Eighteen have been reported as seldom or ever used—but these are the exceptions—and my only difficulty has been to select from the very large list of successes, which have been obtained where sanitary authorities and health officers have worked together energetically and unselfishly for the public good.

At Hastings small-pox epidemics have twice been stamped out. At Bristol on many occasions epidemics from various infectious diseases have been arrested, and notably one of typhus in last year.

At Newcastle-on-Tyne typhus, once endemic, has several times been stamped out. At Leek (Staffordshire), Dr. Ritchie writes—"No case of small-pox has occurred after removing the first to hospital, and the building has been largely instrumental in reducing mortality from zymotic disease." At Coventry, small-pox has twice been stopped—and scarlet fever on several occasions. In Glasgow, where isolation is most admirably provided for, there were during the five years 1861–65 inclusive, before the hospital was built, 3,994 deaths from typhus alone—while in the five years preceding 1877, during which the hospital has been at work there were 553 deaths only, from the same disease, in spite of a largely increased population. A saving therefore has been effected in five years of 4,450 lives, and probably some 37,400 cases of illness from a single disease.

At South Shields, in a rickety wooden building, seven cases of small-pox, brought into the district by sea, in two years, were successfully isolated, and no spread of the disease occurred: whereas eight years ago a similar importation, not so dealt with, was followed by an epidemic in which it was estimated that 10,000 people in the South Shields Union were affected.

At Oxford small-pox has been three times arrested:—at Leicester, twice within the last twelve months:—and at Rugby twice. At Derby an outbreak distinctly due to the closing of the fever hospital and the consequent admission of a small-pox case to the Infirmary, was speedily arrested when the fever hospital was re-opened. At Ipswich small-pox was planted within the Borough no less than twenty separate times in 1877, without once getting a footing. At Haslingden in Lancashire the hospital has been the means of stamping out seven or eight outbreaks within three years. Dr. Vacher's success at Birkenhead is well known, and in the issue of the *Practitioner* for October, 1878, there is a graphic description of Dr. Ashby's successful isolation of small-pox in the Newark, Grantham, and Sleaford combined district. From Warrington I learn that isolation has there, since last May, been completely successful in about twenty-five instances. Many more might be enumerated, but I must close this long list of successful grappling with disease, with the record of the Delancey hospital at Cheltenham. The small-pox block was opened in June of 1873, and during the first six months no less than six cases of the disease were imported from a distance. All were isolated, and in no instance did it spread beyond the family to which it was first introduced. Since then there have been only five fresh outbreaks, but all were isolated with equally satisfactory results. The facts respecting scarlet fever are more difficult to obtain, but there is good reason to believe that prompt isolation in the Gabell block has in not a few instances arrested the spread of that very infectious disease. Little or no difficulty has been experienced in persuading rich and poor to avail themselves of its wards. A young ladies' school at one time nearly filled the private wards; at another several shopmen from a large and fashionable establishment in the town; domestic servants, and boys and girls of the upper classes attending the various schools, have been isolated with no less benefit to themselves than to society and the town at large. One case, the last that has been admitted, deserves special notice, where a child seized with scarlet fever in one of the most fashionable and frequented shops was promptly removed and no further harm resulted.

The space at my disposal is limited, but I must say one word on the isolation of the healthy which has been practised in some of the large towns of Scotland with very great advantage. At Greenock for instance (as I am informed by Mr. Dewar) reception houses have been opened for small-pox and other fevers, in which the uninfected inmates of an infected house pass a period of quarantine while their house is placed in the hands of the sanitary authorities for complete disinfection. At the same time any second outbreak of the disease in the same family is checked at once by removal to the hospital and the poison is stamped out.

In bringing this paper on isolation to a close, I must crave indulgence for its many shortcomings and imperfections. The work of collecting information has been beset by many difficulties, and, as I have said, nothing short of a Government inquiry could arrive at all the facts. That they would be worth obtaining, has, I think, been shown; and I am not without hope that a discussion on the subject of isolation will draw attention to the great benefits arising from isolation hospitals, and perhaps lead to their erection by sanitary authorities, or by private effort, in various parts of the country.

APPENDIX.

URBAN, RURAL, AND PORT SANITARY AUTHORITIES IN ENGLAND AND WALES WHICH ARE PROVIDED WITH ACCOMMODATION FOR ISOLATING INFECTIOUS CASES.[1]

? ? *Indicates that an isolation hospital is said to exist, but no particulars have been obtained.*

* *Sanitary Authorities which have erected or maintain their own hospital.*

* * *Sanitary Authorities which are provided with isolation wards or hospital —either by public subscription* (marked ¶) *or in connection with the general hospital.*

* * * *Sanitary Authorities which report themselves as supplied with accommodation for isolating infectious cases by neighbouring hospitals.*

BEDFORDSHIRE (U. 3, R. 6).[2]—*Bedford and neighbourhood,* ** by Bedford and Cardington general infirmary and fever house. Brick. Two story building, fifty beds. Erected 1848. No small-pox now admitted. Admits paupers at 7*s.* 6*d.* per week. Subscriber's nominee 5*s.* per week. Others from 7*s.* 6*d.* to 2*l.* 2*s.* per week. Bedford urb. small-pox hospital, ? ?

BERKSHIRE (U. 9, R. 12).—*Reading and neighbourhood,* ** Six beds for fever at Royal Berkshire hospital. Chiefly hospital cases.

BUCKINGHAMSHIRE (U. 7, R. 7).—*Amersham,* * Hospital at Chesham. Iron. Five fever beds. Erected 1871 during severe outbreak of typhus. "Only opened once or twice since for cases of small-pox." Cost 297*l.* Farmers assisted with carting, etc.

CAMBRIDGESHIRE (U. 7, R. 8).—*Chesterton,* * rural s. dist. relies upon Addenbrook's hospital. Two wards. Fifteen beds. For enteric only.—*Newmarket,** urb. s. dist. House taken in 1874 during outbreak of small-pox. Paupers admitted. Epidemic successfully arrested. Uncertain if the house is to be retained.—*Wisbech,* ? ? joint urb. and r. Small-pox.

CHESHIRE (U. 35, R. 11).—*Altrincham,* * urb. s. dist. Lloyd's hospital originally built by subscription in 1853. Subsequently enlarged by the urban sanitary authority and handed over to them on a twenty-one years' lease, with the sanction of the Sanitary Commissioners. Half the gross income allowed to go to the sanitary authority. Brick building with one pavilion of corrugated iron lined with varnished wood for small-pox. Brick building. Has sixteen beds. The iron building twelve. Charges 15*s.* per week to 21*s.*, according to means,

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[1] The particulars here given have been obtained in nearly every instance from sanitary officers on the spot; I shall however be much obliged by the correction of any error that may have crept in—or for information concerning the places marked (? ?) from which no returns have been received. Address Dr. E. T. Wilson, Westal, Cheltenham.

The numbers in parentheses after names of counties indicate the number of Urban and Rural Sanitary Districts contained within the county boundary.

21*s.* to all outlying townships. "In six weeks with the additional accommodation an epidemic was stamped out which had raged for nine months previously." *Birkenhead,** urb. s. dist. and neighbouring parishes. Two semi-detached villas adapted in 1875. Brick. Eight rooms for patients. Eighteen beds. The better classes occasionally use it. For account of small-pox epidemic, cf. *B.M.J.*, August 24th, 1878. All infectious diseases admitted. Once nearly all were measles. Patients from Birkenhead 14*s.* per week, from neighbouring parishes 21*s.* per week.—*Bowdon,** urb. s. dist. Uses Altrincham.—*Chester and neighbourhood,* ** Thirty-five beds in separate block, built by the Infirmary Board on their grounds. Paupers admitted. Sanitary authority subscribes 30*l.* per annum. All infectious diseases admitted, 14*s.* per week.—*Runcorn.** Port auth. Six beds.

CORNWALL (U. 20, R. 13).—*Falmouth,* ? ? port.—*Penzance,** urb. s. dist. Stone cottage. Five wards. Eight beds. "Several years in readiness, has never been used, there being no occasion for it. Removal has never been strongly suggested or enforced."

CUMBERLAND (U. 11, R. 9).—*Carlisle and East Cumberland,* ** Committee of the fever hospital bought the house out of the proceeds of sale of an old hospital established in 1820. Brick and stone building. A private dwelling with wards added. Four blocks. Ten wards. Thirty beds, ten reserved for small-pox in detached ward. Paupers admitted at 1*l.* 11*s.* 6*d.* per week. Private cases at 21*s.* per week.—*Penrith,** urb. and r. combined. Two small hospitals. Brick. A quarter of a mile out of the town. Ten beds in each. "Very little required the last six years." *Whitehaven,* ? ?

DERBYSHIRE (U. 30, R. 9).—*Derby,* * urb. s. dist. Eight or ten miles round the town. For population of 100,000. Erected 1872. Wood. Plan of Privy Council memorand., 1871. Built for small-pox epidemic, then closed till the epidemic in 1876. Forty beds. Case of small-pox imported from Liverpool on July 27, 1876, admitted to infirmary in consequence of fever hospital being closed. No other case till August 12, when fourteen cases occurred in the next eighteen days, six of which could be traced directly to the infirmary case. Fever hospital re-opened on September 1st. Epidemic soon arrested. Sliding scale of charges. *Derby.** * Fever wing at the infirmary.

DEVONSHIRE (U. 30, R. 16). — *Teignmouth,** Small cottage. Paupers admissible. "Never yet had an occupant." — *Devonport,** urb. s. dist. Wooden hut erected in forty-eight hours to house a case of small-pox. The shed has been of much use in isolating infectious cases, especially scarlet fever. It is intended to build a better hospital for twelve beds, and plans are being prepared. —*Plymouth,* ? ? urb. s. dist.

DORSETSHIRE (U. 11, R. 12).—*Weymouth,** urb. s. dist. Erected in 1871 during a small-pox epidemic. Wood covered with felt. Cruciform. Eight beds. "There has been no serious outbreak of zymotic disease since 1871, and the hospital has therefore not been required."

DURHAM (U. 29, R. 15).—*Darlington,** town and neighbourhood, 1874. Substantial brick building. Three pavilions and administrative block. Fourteen beds for small-pox, and fourteen for typhus and enteric. Sixteen for other infectious diseases, four of which are in private wards. Making total forty-four beds. Cost of building alone 8,900*l.* Furnishing 775*l.* Road making and drainage 450*l.* 30*s.* per week, or 2*l.* 2*s.* for private ward.—*Gateshead,* ? ?—*South Shields,** urb. s. dist. Old wooden building erected during cholera epidemic. Recently re-opened for urgent cases. "During last two years seven cases of small-pox were introduced by sea. All were isolated and no extension of the disease took place." Plans and estimates approved for a new hospital of two pavilions and thirty-two beds. Money borrowed at three-and-a-half per cent. —*Sunderland,** borough. Brick building. Small-pox in a separate block. Cost in all 2,200*l.* Charges from 21*s.* per week downwards. "Most efficacious in preventing the spread of infectious diseases."

ESSEX (U.17, R. 16).—*Saffron Walden,** urb. s. dist. and *Saffron Walden* rural s. dist., combined. A brick and tile cottage enlarged, 1874. Two wards, twelve beds. Total cost about 600*l.* Payments by the two authorities in proportion to their rateable value. "The hospital is a very great boon and has prevented several epidemics by prompt isolation of first cases."

GLOUCESTERSHIRE (U. 17, R. 16).—*Bristol,** city, urb. s. dist. Two hospitals: one for small-pox, wood, twenty beds; one for other infectious diseases, wood, twenty beds. When typhus visits the city the hospital is closed to other diseases. When there is no typhus scarlet fever is admitted. The two diseases have never clashed as yet. Charges, 5*s.* to 1*l.* per week. Enteric generally goes to Royal Infimary or General Hospital. "Successful in every case as a preventive."—*Cheltenham,** * ¶ urb. s. dist., *Cheltenham,*¶ rural s. dist., Delancey fever hospital. Built by subscription and private munificence. Open to Cheltenham and its neighbourhood; brick. Proposed three pavilions and administrative block. Those now built are, one for small-pox distinct, eight beds in the public, four in the convalescent, and two in private wards; one for scarlet fever, with eight private wards, a convalescent room, and two public wards with eight beds each. Cost: small-pox building 3,000*l.*, laundry and disinfecting ovens, &c., 600*l.*, mortuary 70*l.*, central block, scarlet fever, 4,391*l.* "During the three and a half years since the small-pox block was built the disease has been imported into the town eleven times. All were isolated, and in no instance did it spread beyond the family first attacked." The Gabell or scarlet fever block, opened in April, 1877, has done good service, and the private wards have been much used.—*Cirencester,** urb. s. dist., and *Cirencester,* rural s. dist., combined. A house with five or six rooms purchased and almost rebuilt. Only just opened. —*Gloucester,** city, urb. s. dist. Wood; two blocks with one large and a small ward in each; twenty beds. Total cost about 700*l.* "Did good service in the small-pox epidemic."

HANTS (U. 22, R. 22).—*Andover,** urb. s. dist. A small house, which it is proposed to enlarge. Now has four beds.—*Gosport,* ? ?—*Southampton,** urb. s. dist. Two houses, converted; twenty beds. Charges on sliding scale. "Good results from isolating cases, especially small-pox."—*Portsmouth,** urb. s. dist. Small cottage, rented at 60*l.* per annum; eight beds. One disease admitted at a time. Charges up to 2*l.* 2*s.* per week. "Believe it has checked the spread of small-pox."—*Ryde,** urb. s. dist. Wood, slate roof, two wards, twelve beds, earth closets. "No case in the hospital for a year and a half, when we had one or two cases of scarlet fever."

HEREFORDSHIRE (U. 4, R. 8).—*Ross,*¶ town and neighbourhood. Cottage hospital (Dingwall); has one pavilion for infectious diseases; two wards with two beds each. Cf. plan in Burdett's *Cottage Hospitals,* p. 219.

HERTS (U. 11, R. 13).—*Berkhampstead,** rural s. dist. Substantial brick building, just erected at Aldbury; two wards, four beds each, with separate administrative block. Earth closets. Standing on two acres of land. Cost of building, &c., exclusive of land, 1,630*l.*—*Bishop Stortford,** urb. s. dist. In 1878. Wood, slate roof, two large wards, four beds each. Second block for convalescents will probably soon be built.—*Stevenage,** urb. s. dist. Two old cottages fitted up some time ago during small-pox epidemic; some five or six cases were received. Since then the cottages have not been used.—*Royston,** rural s. dist. Wood; erected, to meet an outbreak of small-pox, *in the workhouse grounds*, where there was already provision for paupers. Charges on sliding scale. "Hospital and oven together undoubtedly prevented several outbreaks of small-pox."

HUNTINGDONSHIRE (U. 5, R. 3).

KENT (U. 33, R. 25, Metropolitan 2).—*West Ashford,*? ?—*Dover,** * ¶ urb. s. dist.; *Dover*, rural s. dist. Two hospitals, first begun in 1869 by Dr. Astley, assisted by subscriptions; second built in 1873. Brick; cottage plan (cf. Burdett's *Cottage Hospitals*). In one house five rooms, in the other four, giving in one twenty, in the other fifteen beds. Some paupers received, also clergyman's family, governesses, &c. Charges from 10*s.* to 21s. per week. Town pays 150*l.* per annum for twelve beds, guaranteed for ten years. Union pays 50*l.* for six beds. "Effects so marked that I wish the system of isolation could be enforced."—*Folkestone,** borough, urb. s. dist. Central block just erected, containing six wards, two of three beds and four of two beds each. An administrative block adjoining, and two wings with two wards each, six beds to each ward. The wings not yet erected. Total cost of central block and administration 3,000*l.* Fourteen beds in central block, twenty-four in wings.—*Margate,** urb. s. dist.; *Ramsgate*, urb. s. dist.; and *Isle of Thanet*, rural s. dist., combined. A wooden hospital, felted, and slate roof at Northwood. Sixteen beds. Building cost about 1,372*l.* In constant use.—*Lewisham,** rural s. dist. Hospital at Hithergreen. Hired in 1871; since purchased. Twelve beds. "Patients, chiefly domestic servants, but superior classes treated frequently."—*Sevenoaks,** urb. s. dist. Old moderate-sized house, held on lease, a mile from the town. Three stories, three rooms on each, and some out-houses in a garden. First floor, each room has one bed; second floor kept for emergencies. Nurses, as required, from Dover. "Fortunately have not been pressed by two infectious diseases at one time. Have urged the authority to build a wing. Answers admirably. Several small-pox outbreaks quickly stamped out by isolating first cases."—*Tonbridge*, ? ?

LANCASHIRE (U. 126, R. 25).—*Bacup* united with *Todmorden* which see.—*Blackburn*, ? ?—*Barrow-in-Furness*, ? ?—*Burnley,** urb. s. dist., *Burnley*, rural s. dist., combined. Opened two years ago during epidemic of small-pox. Three cottages thrown into one; ten beds. 1*l.* per week per patient charged to the rural authority, all attendance found, except medical. "Hospital rarely used; of great advantage during a small-pox epidemic."—*Haslingden,** urb. s. dist., *Haslingden*, rural s. dist. and *Rawtenstall*, urb. s. dist., combined. Hospital built by rural sanitary authorities of Haslingden, in 1875. Iron building (Braby & Co.); twelve beds for small-pox only. The two other authorities pay for patients. Maintenance always, as yet, paid by sanitary authorities. "Every fresh case of small-pox during the last three years has been isolated, and it has been the means of stamping out seven or eight outbreaks in the three districts."—*Lancaster*, ? ?—*Liverpool and neighbourhood*, ¶ Netherfield House, Everton. Established 1858. New building in 1872. Brick; floors, hydraulic cement. Two extensive wings with two floors each, divided into wards with one to twenty beds in each. Administrative block between the wings; 100 beds. All infectious diseases received. Managed by a committee. All classes received. Charges: first class, 2*l.* 2*s.* per week; second class, 21*s.* per week; third class, 10*s.* 6*d.* per week; heavy loss on third class. Building cost 12,000*l.*—*Manchester and neighbourhood. Monsall Fever Hospital,* * * Raised by Trustees of Manchester Royal Infirmary. (*a*) A large brick building, two floors, eight wards on each, with seventy beds. Medical officer and nurses in separate building. This block for typhus, enteric, and scarlet fever. (*b*) Small cottage hospital, with private wards for better classes; sixteen beds. (*c*) Two pavilions, wood, for small-pox; eighteen beds. (*d*) Three temporary wooden huts for small-pox. 25*l.* per bed, with 120 beds. All classes admitted. Both urban authorities and Guardians have arrangements to admit patients. "Private patients few." Also twenty-six beds for fever at the *Pendlebury* * * Hospital for Sick Children.—*Ormskirk*, ? ?—*Salford*,* borough, urb. s. dist. *Wilton Hospital*, erected in 1876 during small-pox epidemic. Row of four houses adapted. Front entrances made into windows; entrance to each of the four houses being from a corridor built at the back. Eighty beds. All infectious diseases admitted. Guardians pay 21*s.* per week. Private ward 3*l.* 3*s.* as a minimum. "A short time ago we had typhus, scarlet fever, and measles at one time, all completely isolated." *Southport*,* borough, urb. s. dist. Iron lined with wood. Six pavilions: (No. 1.) two wards, six beds each; (No. 2) two wards, six beds each; (No. 3) washhouse; (No. 4) mortuary; (No. 5) central administration; (No. 6) coal shed, ambulance, &c.; twenty-four beds in all. Guardians pay 3*s.* 6*d.* per day for paupers.—*Warrington*,* urb. s. dist. Built in May, 1877. Brick; walls lime washed; floors pitch pine. At present only one building; twelve beds and administrative block. Another block similar to the present and a convalescent ward of four beds now being erected. Charges 21*s.* a week to those able to pay. "Already in about twenty-five instances isolation has been a complete success"—*Whittington*,*** urb. s. dist. Arranges for certain number of beds at Monsall Hospital, Salford.

LEICESTERSHIRE (U. 10, R. 10).—*Leicester*,* borough and county, urb. s. dist. Iron and wood, eight wards, twenty-five beds. Charges 21*s.* per week for paupers, poor from Bow free, 1*l.* 11*s.* 6*d.* for county cases. "Two epidemics of small-pox arrested within the last twelve months." Four wards * *; thirty-two beds at infirmary separated by a double door from one of the medical wards for enteric or erysipelas.

LINCOLNSHIRE (U. 24, R. 14).—*Great Grimsby*, ? ?; *Horncastle*, ? ?. *Little Gonerby*,* urb. s. dist.; *Grantham*, urb. s. dist., *Grantham*, rural s. dist., combined. During summer of 1878, for epidemic of scarlet fever, a wooden administrative building with tents at Little Gonerby—sixty-six cases treated in them. While tents were occupied, a case of small-pox occurred which was isolated in a tent in an adjoining field and the disease arrested. *Lincoln*,* urb. s. dist. Wooden building for eight beds, erected in 1872 during an epidemic of small-pox. "I believe we have prevented two or three epidemics by immediate isolation." *Ruskington*,* urb. s. dist. A tent improvised in summer of 1878, to meet a case of small-pox.

MIDDLESEX (U. 18, R. 4, Metropolitan, 38).—LONDON—*Highgate Small-pox Hospital*, * * ¶—Voluntary subscription. Brick and stone; walls plaster and cement; partly of tiles in two wards. Two buildings connected by a bridge; one containing ten wards and four for noisy cases; the other two wards; ninety-five beds in the larger block for small-pox, fourteen in the smaller for other infectious diseases. 4*l.* 4*s.* admission fee. *Fever Hospital*, * * ¶ (Islington), founded 1802 by subscription. Additions in 1864 for typhus and in 1870. Private wards lately added. Brick building. Each side of the hospital consists of four general and four private wards. Of the former one is for enteric, sixteen beds; two scarlet fever, sixteen beds each; one convalescent, with twenty beds; two distinct typhus wards, thirty beds each; eight handsome private rooms used for all sorts of infection. Paupers admitted up to 1871—not since. No small-pox now received. *St. Marylebone*,* s. dist. Built in 1871 by the Vestry during a small-pox epidemic. Sixty beds. The hospital has, I understand, been done away with.

*St. Pancras,** s. dist. Built by the Vestry in 1871. Wood and iron (Braby and Co.), forty beds, for small-pox only. Three guineas charged on reception of a patient. "Hospital still standing and used temporarily for extra workhouse." *Poplar,** s. dist. Built by Board of Works. Two double story pavilions in brick for seventy-two beds. With an administrative block, cost, without fittings, about 14,000*l.*, just completed.—*Outside London : Hornsey* * * * sends small-pox to Highgate at 4*l.* 4*s.* the case. Fever to London Fever Hospital.

MONMOUTHSHIRE (U. 16, R. 6).—*Newport,** port authority. Two houses belonging to the Corporation ; adapted for *seamen only.*

NORFOLK (U. 10, R. 20).—*Norwich and neighbourhood,* * Iron hospitals presented by the Dowager Marchioness of Lothian to the city. Patients admitted only with the sanction of medical officer of health. Paupers, 6*s.* 6*d.* per week ; better classes, 10*s.* 6*d.* per week. *Great Yarmouth,** urb. s. dist. Built in 1876. Two buildings, one of brick, the other of wood. Brick building has two large wards, six beds in each ; in centre an administrative department. The wooden building used generally for convalescents ; six beds. Charges, 2*s.* per diem. *West Wymer,* ??

NORTHUMBERLAND (U. 18, R. 12). —*Newcastle-on-Tyne,** urb. s. dist. One stone block built by subscription seventy years ago. One block of wood, by the Corporation. Stone block has seven wards, thirty-six beds. Wooden block has twenty-four beds in two wards. Charges, 2*s.* per diem. "The hospital has been the means of stamping out typhus (which was once endemic) several times of late years. I wish much to have separate wards for private cases."—*Tynemouth,** urb. s. dist. Wood, cottage plan, eight beds. Paupers in one end, private patients in the other, at 2*s.* 6*d.* per diem.

NORTHAMPTONSHIRE (U. 8, R. 12).—*Kettering,** urb. s. dist. Erected originally during small-pox epidemic by the Kettering Union, but now used only for the town and adopted by the sanitary authorities. Two buildings, one brick, the other of two thicknesses of wood with sawdust between. Floors, in the one asphalte, in the other wood. One building used for convalescents ; twenty beds in all. "Results satisfactory in all cases."—*Northampton,** urb. s. dist. Wooden shed, erected a few years ago during an epidemic of small-pox. Forty beds ; small-pox only received.—*Peterborough,** rural s. dist. Wooden hut with three rooms ; ten beds. Takes all cases of infection. "Case of small-pox from Newark, in 1877, isolated, and no extension of disease took place."—*Peterborough,*** town. A four-room cottage in the grounds of the General Infirmary ; nine beds. Takes all cases except small-pox. No proper place for private cases. The building of a hospital is contemplated.

NOTTINGHAMSHIRE (U. 13, R. 7).—*Nottingham,** urb. s. dist. "Garden Hospitals," erected in 1875. All infections received. Maximum charge, 1*l.* per week. "Useful in scarlet fever epidemic in 1875. A commencing epidemic of typhus was also checked at once by the hospital."—*Newark,** urb. s. dist. A wooden hospital of two wards, four beds in each. Erected in 1877, during an epidemic of small-pox. Six tents. Radcliffe tent, 16 × 14, for two patients = 1,850 cubic feet. Marquees, 30 × 16, for four acute cases. A medical man from London lived in a bell tent. "This year the hospital has been very useful. Three cases of scarlet fever were sent in and the disease was stopped. Subsequently a case of small-pox was admitted, and its further spread prevented." *Vide Practitioner,* Oct., 1878.

OXFORDSHIRE (U. 7, R. 8).—*Banbury,** urb. s. dist. Brick house and wooden sheds, taken five or six years ago during small-pox epidemic. Only small-pox cases received. Leave is given for scarlet fever, but none are sent.—

*Oxford,** urb. s. dist. At Headington. Wood; erected during epidemic of small-pox. Two wards, eight beds each. "Small-pox and scarlet fever have been received but not at the same time." Paupers admitted. "On three separate occasions small-pox imported into the town has been isolated in hospital, and no further cases occurred." Block at Radcliffe Infirmary, * * ¶ in 1877, partly by grant of Radcliffe trustees, partly by subscription. Brick. Separate one-storied building of two wings, with central administration. Each wing contains one large ward of six beds, one smaller ward of two beds, one nurses' room dividing these, one bath-room and ward offices. This is monopolised by scarlet fever, and is only available for one disease at a time. Local Board pays 2*s.* 6*d.* per diem for patients. Another detached portion of the Radcliffe Infirmary is devoted to enteric diphtheria and erysipelas. *Thame,** urb. s. dist. A mere cottage, not well adapted to the purpose and without water supply. Opened in 1877 during an epidemic of small-pox. "Some good was done by removing cases from the crowded parts of the town."

RUTLANDSHIRE (R. 2).

SHROPSHIRE (U. 11, R. 15).

SOMERSETSHIRE (U. 17, R. 17).—*Bath,** urb. s. dist. Bath-stone house, adapted 1875. Five wards. Room for nurse, &c. Standing in about eight acres of land. Fifteen beds. Infectious cases at present limited to scarlet fever and typhoid in cases of over-crowding. "Practical results in preventing the spread of epidemic diseases most satisfactory."—*Bridgwater,** urb. s. dist. Building on Local Government plan. Earth closets. Four beds used, room for eight. No charge for admission. "It has been of unspeakable value to the town in preventing the spread of epidemics, especially small-pox. I have employed it in four separate cases occurring among sailors, and feel confident that by its means prevented the disease from spreading."—*Weston s. Mare,** urb. s. dist. Erected recently; a stone and brick building with cemented floor on plan of local government board. About half a mile from the town. Cost exclusive of land and furnishing about 550*l.* Eight beds. Paupers admitted.—*Weston s. Mare,* ** A small building erected by the hospital board about ten years ago. About twenty yards in the rear of the hospital; two wards, two beds each. Patients admitted by letter. Pupils from schools, &c. Scarlet fever has predominated. "This little building has been a great boon to the town, as immediate isolation has prevented many an outbreak."

STAFFORDSHIRE (U. 39, R. 15).—*Handsworth,**** urb. s. dist. Has arrangement with Children's Hospital in Birmingham.—*Leek**, urb. s. dist. 1874; Wood. Two wards with fourteen beds. A more permanent building intended. "Results very marked."—*Newcastle-under-Lyme,** urb. s. dist. A corrugated zinc hospital erected seven years ago during a small-pox epidemic, and has never since been used.—*Stoke-upon-Trent,** * and *North Stafford,* uses brick detached wards at the North Staffordshire Infirmary. Two wards in two stories, ten beds, each with rooms for nurses. Scarlet fever, measles, typhus. Typhoid is admitted to the general wards. All classes admitted. Parishes which subscribe send 3*l.* 3*s.* with each case. "Very little used, although scarlet fever is constantly rife in the neighbourhood, neither the people nor the sanitary authorities seem impressed with the necessity of isolating cases."—*Walsall,* ? ?—*Willenhall,** * * urb. s. dist. Sends to South Stafford Hospital at 3*l.* 3*s.* per case.—*Wolverhampton,**** urb. s. dist. Has arranged with Wolverhampton and Staffordshire General Hospital to take all infectious cases at 3*l.* 3*s.* per case, in a detached brick building forming a wing of the hospital. Eighteen beds.

SUFFOLK (U. 11, R. 12).—*Bury S. Edmunds,* ? ?—*Ipswich,** urb. s. dist.;

Ipswich, port, combined. A wooden building hastily run up in 1872, during n epidemic which cost many lives and many thousands of pounds. Thirty beds. In twelve months small-pox was introduced on seventeen different occasions into the borough and three times into the port without once getting a footing. "The last two cases of small-pox occurred in patients recovering in hospital from typhoid and scarlet fever. It was supposed that the thinness of the partitions accounted for the infection finding its way from the male to the female side." The hospital has been condemned and ground purchased for a new one.—*Lowestoft*,* urb. s. dist. Wood covered with felt. Two wards. Ten beds. For small-pox. Results decidedly good. Cost of building 570*l.*—*Lowestoft*,* port. Wood. Erected on an old wherry platform. Two wards. Ten beds.—*Risbridge*,* rural s. dist. Erected during an outbreak of small-pox. Since allowed to fall to pieces. "A new one will probably be built."—*Sudbury*,* urb. s. dist. Two houses attached outside the town. Opened two years ago. Twelve beds for small-pox. Paupers admitted, not as paupers.—*Sudbury*,* rural s. dist. A set of cottages being provided for pauper and non-pauper cases. Proposed to have seven in different parts of the district. Two double cottages, isolated, have already been provided.

SURREY (U. 14, R. 11, Metropolitan, 11).—*Wimbledon*,* urb. s. dist. Originally a private house standing in good sized garden. Larger rooms contain two or three beds. Room for twenty. Thirty beds. All infectious diseases received.

SUSSEX (U. 19, R. 21).—*Brighton*,** town. Depends on sixteen beds set apart for fevers at the Sussex County Hospital. No small-pox admitted.—*Eastbourne*,* urb. s. dist. A galvanised iron building. Twelve beds. "Large hospital now building in the workhouse grounds, sixteen beds to which paupers and *possibly others* will be admitted."—*Hastings*,* urb. s. dist., and *St. Leonard's*. Brick cottage divided for two diseases. Ten wards. Two convalescent wards and nurses' rooms. Cost 1,250*l.* Twelve beds for each disease. Scarlet fever and small-pox, or typhoid, and one other. Those able to pay are charged. "The sanatorium is much sought after and willingly entered; it has twice been the means of stopping an epidemic of small-pox by the immediate removal of imported cases."—*Lewes*,* urb. s. dist. Brick building. Two wards, six beds each, and nurses' room, in one block. Kitchen with convalescent ward in a second block. Earth closets. Charges 15*s.* per week and upwards. "Only two mild cases of scarlet fever have been admitted since it was built."—*Petworth*,* urb. s. dist., *Petworth*, rural s. dist., combined. Two substantial cottages with a living room and two bed-rooms in each, built some years ago by Lord Leconfield and let at a low rate to the sanitary authorities. No charges made. "Paupers and non-paupers admitted, have never required admission together; if they did, there might be a difficulty." "The hospital has been of great use."—*Tunbridge Wells*, ??—*Worthing*,* urb. s. dist. Iron hospital open to paupers and others. "Only used once by a young man who had scarlet fever."

WARWICKSHIRE (U. 14, R. 12).—*Alcester*,* rural s. dist. Two wooden buildings; walls lined with felt half way up and white-washed; two wards in each, with a total of sixteen beds. Erected in 1876. Cost of building 305*l.* Charges for poor above paupers 5*s.* to 10*s.* per week. "In all probability some outbreaks of scarlet fever have been averted."—*Aston*,* * * urb. s. dist. Has an arrangement with Birmingham.—*Birmingham*,* urb. s. dist. Building erected in 1875; walls and ceiling varnished pine. *Fever Hospital* has two wards with twenty beds in each, separated by double wooden boards with sawdust between; gabled slate roof; earth closets. *Convalescent Block* contains twenty-four beds. Total sixty-four beds. A solid wall divides these precincts from those of the workhouse. All classes residing in the borough are received. The *General Hospital* * * has two wards with sixteen beds for the reception of infectious disease other than small-pox. *Queen's Hospital* * * at present has only four beds for infectious cases. Enteric is received into the general wards. *Children's Hospital,* * * has distinct buildings for infectious diseases. Erected in 1876. Four wards, two with ten beds each for scarlet fever, two wards with four beds each for croup and diphtheria, one quarantine ward with three beds—thirty-one beds in all. Wards lined with glazed tiles.—*Coventry,** urb. s. dist. Iron building, erected in 1872 during an epidemic of small-pox. Closed afterwards, and only re-opened permanently in 1874, when another epidemic had broken out and was extending. Two wards with six beds in each. The building is in the grounds of the Coventry and Warwickshire General Infirmary, but quite distinct in every way from it. "It was only by offering such inducements as free admission that we could get any patients. It is a matter of education. I do not think the people would ever consent to pay. We have twice prevented the spread of small-pox, and on several occasions the spread of scarlet fever into an epidemic has been stopped by means of the hospital. It is the only mode of preventing the spread of disease." —*Rugby,** urb. s. dist., *Rugby,* rural s. dist., combined. A rural building, erected during a panic caused by a small-pox epidemic in 1874, after plans of Local Government Board. Two large wards, sixteen beds each, connected with a house which serves for administration. Cost 2,069*l.* ; expensive, owing to hasty building. All expenses paid by local authorities. "Has twice been of great service in stamping out outbreaks of small-pox."—*Solihull,** rural and suburb. s. dist. Brick building ; two pavilions and administrative between with convalescent ward ; twelve beds. Cost of building 2,000*l.* Two different diseases may be treated simultaneously in two separate blocks, or during severe outbreaks both blocks can be used for one disease. Charges 2*l.* per week for those who can afford. "Though only open nine months has repeatedly been of service in stamping out disease. Patients, as a rule, have much better chance of recovery than in their own houses."—*Warwick,** urb. s. dist.; *Leamington,* urb. s. dist.; *Milverton,* urb. s. dist.; *Lillington,* urb. s. dist.; *Warwick,* rural s. dist., and union. A brick building, which was originally an adjunct of the workhouse, but transferred in 1877 to these sanitary authorities, during an outbreak of small-pox. Two wards of eight beds each. "Too small for the district. A committee has been appointed to secure a site on which to erect a proper hospital."

WESTMORELAND (U. 5, R. 3).

WILTSHIRE (U. 12, R. 17).—*Devizes,* ? ?—*Swindon Old Town,** urb. s. dist. A small house outside the town. Opened in 1873 during an epidemic of small-pox. "Not been used since the epidemic during which it was opened. There is a 'pest-house' but it has not been used for fifty years."—*Trowbridge,** urb. s. dist. An old factory was lent and opened in March, 1877, during a severe outbreak of scarlet fever. Earth closets. Closed September 25 of same year, after fifty patients had been treated in it, and the spread of the disease checked. Now a question whether to sell or keep the furniture.—*Warminster,* ? ?

WORCESTERSHIRE (U. 15, R. 12).—*Droitwich,* ? ?—*Worcester,** urb. s. dist.; *Worcester,* rural s. dist., combined. An old house, well isolated, five or six rooms ; rented at 60*l.* per annum ; twenty-four beds. All infections admitted and all classes ; 25*s.* per week for those who can pay. "Practical results good. Many of the patients are young people in houses of business, servants, &c." Infectious ward at General Infirmary.

YORKSHIRE (U. 173, R. 54).—*Barnsley,** urb. s. dist. Brick building ; four wards in one block. Cost of building 852*l.* 4*s.* 8*d.* Eight beds. "A great help in checking small-pox. Never had more than eight or nine patients in a year." —*Birstal*,* * * urb. s. dist., uses Bradford, several miles away.—*Bradford*,* * urb. s. dist., and neighbourhood. Subscription hospital, of brick, built in 1872. Four pavilions and an administration block, connected by closed corridors. Some private wards. Eighty beds. Charges: Poor free, domestics in place and others able to pay 3*s.* per day; cases from North Brierly 1*s.* 6*d.* per day. "Epidemic of small-pox in New Leeds during December, 1873, cut short by isolating cases." —*Chirwell*,* * * urb. s. dist., relies on Leeds.—*Cleckheaton*,* * * urb. s. dist., depends upon Bradford.—*Elland*,* * * urb. s. dist., relies upon Halifax.—*Forsley*,* * * urb. s. dist., uses Bradford.—*Goole*,* urb. s. dist. Hospital near the workhouse; taken over by the sanitary authorities. The Local Government Board insisted on its being separated by a wall from the workhouse.—*Halifax*,* urb. s. dist. A large Hall in the midst of a park converted, in 1871, during epidemic of small-pox. Sixty beds. All classes admitted, and all infections. Paupers, charged to the Guardians, 25*s.* per week, others 10*s.* per week, children under twelve at 7*s.* 6*d.* per week.—*Hunslet*,* * * rural s. dist., relies on Leeds.—*Hull*, ??—*Huddersfield*,* urb s. dist. An old workhouse in three distinct parts. Brick; white-washed inside. The main building contains rooms for nurses, &c., and four rooms upstairs available for patients; two or, if required, three of these could be fitted up for private cases, reserved for typhoid, and convalescents; twelve beds. Second block, two lofty rooms, recently built for scarlet fever; twenty beds; would be used for small-pox if required. Third block, a rickety old hospital of the poor-house, six rooms upstairs. Most cases pay nothing. "Have the greatest faith in isolation if done early and clothes, &c., properly disinfected."—*Leeds*,* town and out-townships. In 1872 some wooden sheds, originally provided by the Guardians for cholera, were opened by the Corporation for small-pox during an epidemic. Whereupon the House of Recovery, which up to that time received small-pox, declined to receive it. Paupers free, also those just above; persons from out-townships 15*s.* per week; private ward 21s. per week.—*House of Recovery*, * * ¶ established 1802. Built by subscription; added to in 1874. Eighty beds. All classes received, and all infections, except small-pox. Unions pay 1*s.* 9*d.* per day, which does not cover expenses.—*Middlesborough*,* urb. s. dist., and whole Union. Brick building, two wings with connecting corridor and administration; eight wards, four small and four large; fifty-four beds. Cost of building 5,000*l.*, cost of maintenance, &c., adds 1½*d.* in the £ to the rates. 5*s.* per diem for paupers, 7*s.* 6*d.* for other cases. When there is room it is open to the whole Union. "Have been very successful in checking small-pox. Cannot give so good a report of other diseases, but I believe we have done good, especially to the patients removed."—*North Bierley*,***, urb. s. dist., relies upon Bradford.—*Scarborough*,* urb. s. dist. Brick building; two wards with forty beds. Total cost, 1,000*l.* No charge for admission. "Very soon stamped out the small-pox epidemic here in 1871–72; since which time it has not been required."—*South Stockton*,*** urb. s. dist.; uses Middlesborough.—*Todmorden*,* urb. s. dist.; with *Bacup* (Lancashire). An old cotton mill converted; two wards upstairs and two more downstairs, if required; sixteen beds. "It had a decided effect in checking a small-pox epidemic when it was started."—*Wakefield*,* urb. s. dist. Erected in 1874 (?), after plan of Local Government Board. Twenty beds. "Never had a patient in it."

WALES (U. 59, R. 47).—*Aberdare*, * urb. s. dist.—*Cardiff*, * urb. s. dist.; *Cardiff*, port, combined. A wooden building in connection with the *Hamadryad* hospital ship. Two wards, twenty-five beds each. All infections in the same ward. "In no case have I found any ill result from treating different fevers in the same ward." The hospital used almost exclusively for seamen, but town can send cases at 3*s.* per day.—*Carmarthen,** urb. s. dist. Three or four rooms in the old borough jail partially furnished for infectious cases. "There has been no application or necessity for their use. The local authority has given me *carte blanche* to get all necessaries, if required."—*Haverfordwest,* ** Just built in connection with the infirmary. Six to eight beds.—*Merthyr Tydfil,** urb. s. dist.; *Merthyr Tydfil,* rural s. dist. Two buildings. One of brick at Tydfil's Well, built in 1849 during the cholera epidemic, with two wards in one block; fourteen beds; earth closets. The other of wood, at Dowlais, built in 1869; four wards in two blocks; thirty-two beds; earth closets; satisfactory. "Fever, cholera, enteric, and typhus have been treated together with no ill results. The health of the population is preserved, and the mortality from infectious diseases reduced, as shown by successful isolation of cholera in 1866, of typhus in 1869, of relapsing fever in 1870, of enteric in 1871, and of small-pox in 1872."—*Milford,** port. Cottage, for sailors only.—*Swansea,** urb. s. dist. An old infirmary fever hospital; can make up fifty beds.—*Wrexham,* ** Urban and rural sanitary authorities send cases to a detached isolation block at the General Infirmary. Three wards. Seven beds for the Union, with a population in 1871 of 48,837.

THE PRACTITIONER.

MARCH, 1879.

Original Communications.

ON THE MODERATE USE OF ALCOHOL.

BY DYCE DUCKWORTH, M.D., F.R.C.P.,

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> "Many doctrines very importantly erroneous; many remedies either vain, or even noxious, are daily imposed upon the world for want of attention to this great truth: that it is from general effects only, and those founded upon extensive experience, that any maxim to which each individual may with confidence defer, can possibly be established."[1]

PUBLIC attention continues to be directed to the question as to whether the employment of alcoholic drinks is either necessary or beneficial to the community at large.

Many dogmatic assertions have been made, and strong feeling has influenced the discussions upon this matter.

I believe that sufficient evidence has been adduced to sanction the acceptance of plain and warrantable facts, and to afford a rational stand-post of agreement for all sensible and right-minded persons.

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[1] Extract from a communication read before the Royal Society, "On the Influence of Cold upon the Population of London." 1796. By William Heberden, jun., M.D., F.R.S.

Much of the difficulty which encompasses the investigation of a question of this nature arises from the inability, common to many persons, to weigh evidence. And even in the temperate discussion of questions such as these, which are in their very nature partly scientific and partly matters of every-day experience, at the hands of skilled members of the medical profession, it would often be well to submit the facts elicited for a calm opinion from other unbiassed and logical minds, such as may be found, for example, amongst practised lawyers. Such an opinion could not fail, I imagine, to commend itself to a large majority of thoughtful and intelligent persons. And it is hardly possible just now to include amongst the latter some of the pungent writers and intemperate platform speakers who seek fanatically with the best and most humanitarian motives, no doubt, to influence and prejudice public opinion against the use, in any form, or to any extent, of alcoholic liquors.

I think there can be no doubt that the weight of evidence collected from all sources at the present time is largely in favour of those who employ alcoholics temperately. It is manifestly impossible to lay down a Procrustean formula for moderation capable of universal application, yet some recent writers[1] who uphold and defend the moderate use of alcohol do not hesitate to prescribe very definitely in this direction.

In this, as in many other cases, the limits imposed by physiological indications fail completely in numbers of individuals. The circumstances are however different in dealing with alcohol in disease, for here, most certainly, the employment or withholding of alcohol is a matter of very definite prescription, requiring the same clinical acumen as is called for in determining the necessity for, or the dose of calomel, quinine, or other drugs. Alcohol then for the sick is distinctly to be regarded as a drug.

The tendency to dogmatize upon such a subject as this is much influenced by the peculiar personal experiences of the writer. Each man's case is better known to himself than to another, and having discovered a formula for his own idiosyncrasies, he is much beset by the temptation to enjoin the same upon all who seek his advice, and to count all who disagree with him as careless or unwise persons. It is surely absurd that a man who has reached forty years of age should seek opinions as to his drink or diet from any one. Each man proverbially stands to himself at that age as "his own physician or a fool." He must have found out ere that time what is best for him, and if he is indifferent about the matter, no surer sign is present than that all is well with him.

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[1] In the last number of the *Contemporary Review*.

Without doubt, alcohol is blamed nowadays in many instances for tissue-changes that it is truly innocent of producing. Some writers, even on the moderate side of this question, distinctly ignore the facts of inherent diathesis, and the inevitable development, in time, of their associated cachexiæ. Yet the educated physician can never lose sight of these in dealing with each individual who comes before him, and each case must be considered and treated in view of this.

Again, the sum of organic powers constituting the life of each individual varies infinitely, so that some persons are really only half alive as compared with others. If this be acknowledged, how is a concise rule in any matter of habit or diet to be applied blindly all round ?

The very endeavour to find a formula that shall commend itself for daily prescription amongst the profession is, in my opinion, a feeble pandering to a silly craze that is fashionable just now in sections of the public.

What, I ask, shall we think of it all—say in ten or fifteen years' time ? will these formulæ still be demanded, will any be found to work practically at that period ? I believe not. The public did not require to be told that the doctors were unanimous in condemning gross drinking and the stupid tippling habits that have crept into many grades of society. They have always been on the side of decency and public morality, but none have so well known as they, from their sad familiarity with the evils of these habits, the hopelessness of combating them by any cut-and-dried formulæ or injunctions. The treatment of the immoderate and of the drunkard are recognised matters in the practice of physic. The regulation of drinking habits for the mass of the community is another question, sufficiently difficult indeed, but most certainly not to be solved by an attempt to secure universal abstention from alcoholics.

I think we may not altogether accept the dogmatic statements and concise prescriptions emanating from distinguished physicians on this subject, without having regard to a degree of personal bias that may possibly influence their opinions, and for this reason, that their conditions of life necessitate for them extreme moderation in alcohol. It will hardly be contested that the circumstances under which hard-working professional men labour in large towns, are just those which are most prone to develop gout or foster any gouty tendency. The teasing feverish life, much of which is passed in an exhausted atmosphere, leads to large demand for food at certain hours to feed the brain and nervous structures. But there is often associated with, and engendered by, such conditions, a degree of enfeebled digestion, and by the time hard work has begun to press heavily, signs of inability to indulge in any but the most moderate allowance of alcoholics appear. Thus it happens that a majority of professional men are pretty well agreed that they can best do their work with very little wine.

Malt liquors come first to be discarded by those who labour in large towns, and with many, little more than a few ounces of claret or an ounce of brandy or whisky, well diluted, is found useful, generally at an evening dinner. In most of such instances it will be found that tea, coffee and milk can be freely taken and digested.

The experience of the majority of hard-working lawyers and physicians would go, I believe, to prove that the modest allowances just mentioned, are both agreeable and beneficial, agreeable for the sensuous gratification of the palate (a perfectly legitimate one, be it remembered), and beneficial for the distinctly better promotion of digestion.

The strongest of such men mostly find that they can abandon alcohol when making holiday in pure air with impunity, at any rate up to forty years of age, but many of them can also testify that they are capable of taking without any appreciable ill effect upon their heads or stomachs, under such conditions, quantities and varieties of alcoholics that they dare on no account venture to indulge in in mid-professional life.

At all events, a rule is found to work in many instances respecting the time of day when alcohol is taken. Professional men commonly do best without it during the day. What they take is consumed at a late dinner. And the same practice may well be followed by large classes of people in all communities. Yet it would not be warrantable to deduce from this any hard-and-fast rule for all persons. In numberless instances we must allow that a full measure of wholesome health is maintained by people who never live by rule, and who have taken alcoholics with a mid-day meal with impunity for years.

It may be a matter of waste or one of over-indulgence, but the subjects of it do not ask our pity or our advice; they are temperate persons, and perhaps their ancestors were so before them. They have neither apprehension of premature textural decay, nor dread of evil consequences of any kind to mind or soul.

I am not satisfied only to have the *medical* testimony respecting alcohol, and desire to see as publicly promulgated that which could be so well afforded by other professional men, and by persons in different walks of life who have carefully considered the subject, and who are also sufficiently capable of weighing evidence and making logical deductions.

We have not yet had laid before us the disadvantages of water-drinking. Not to quote my own experience only, but that of others, it may be stated that, taken late in the day, digestion is not comfortably completed when a pint or more of water is added to the meal.

If no alcohol be taken, water is taken very freely; if a good sparkling mineral or simply aërated water—iced—is used, less is called for, unless a variety of dishes is partaken of. One great advantage of wine or alcohol with a principal meal is that it enables less dilution of solid food to occur during primary digestion. If hot soup be taken at the outset (an excellent dietetic practice) sufficient water is afforded thereby, and the gastric powers are summoned to their work.

Dilution is instinctively called for during a later digestive stage, and hence the value of weak tea after dinner, and the explanation of the Japanese custom of taking hot water at that time. The large ingestion of solid food (an indubitable fact) and of cold water as practised by teetotalers, cannot be considered in accordance with gastronomic laws. The subsequent distention and discomfort accruing from it can certainly be very quickly relieved by a little neat brandy or good liqueur. In other words, the primary digestion is aided by alcohol. If we conceive the solid food taken to be both coarse in quality and imperfectly cooked, as is almost always the case with the meals of the lower orders in this country, we can better understand the propriety and value of such a nutrient fluid as good beer.

Nor must we forget the bad water which falls to the lot of many communities to drink.

It is not to be denied that many persons maintain full health and working-power as water-drinkers. It is well or better for them, however, if they can keep a good cook, and secure the best of food at all times. Neither is it to be denied that to many whose nervous and digestive powers are feeble, a little alcholic food is supremely useful and necessary.

We are not all similarly constituted, we are not all physiological units, undergoing experimentation in the laboratory, with every care bestowed upon us to avoid fallacies, and prevent interference with the results to be calculated out from our performances.

We have to do our work in the world, to bear the rubs and trials of life, and to do the best we can for ourselves and our fellow men, and so we resent any dictation at the hands either of priests or philosophers when our experience and our common sense impel us.

The outcome of this for each one of us, as rational beings who do not inherit morbid appetites, and have a wholesome control over our actions, is *moderation*. We can find no more measured definition of what this is, and in truth, we do not want any. It cannot certainly be weighed, and, as we have said, it cannot be measured.

Herein, I believe, lies a principle that will work now and for all time. We cannot prescribe more definitely, and we can no more impart the knowledge to others than we can teach an art to a novice by placing a manual of instruction under his eyes.

I hold that the sober and right-minded of the community are in no degree called upon to forego what is good for them in order to secure an imaginary benefit for fools and self-indulgent persons who elect to injure themselves.

The attitude assumed now by the medical profession on this question is of high importance, and it behoves all who express opinions from within its ranks to take care that these be entirely guided by that sagacity and magnanimity which are surely part of its heritage, and quite inseparable from the practice of its calling.

THE PHYSIOLOGICAL ACTIONS OF ACONITE AND ITS ALKALOID.

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(*Continued from* p. 112, vol. xxii.)

IV.—ACTION ON THE VASO-MOTOR NERVOUS SYSTEM.

THE exhibition of aconite or its alkaloid is never followed by vaso-motor paralysis. In experiments already detailed, naked-eye observations of the interior surface of reflected flaps of the aconitized frog's skin exhibited no signs of undue vascularity: and in subsequent experiments on the rabbit, the blood-vessels of the ear underwent no apparent change during the whole period of poisoning. The following microscopical observations were made on the circulation in the web of the aconitized frog, and are partly demonstrative of the influence of that drug on the vaso-motor nervous system.

Experiment XXXIII.—A healthy, medium-sized male frog, received under the skin of its back an injection of $\frac{1}{800}$ gr. aconitia. Transitory capillary stasis immediately ensued in the blood-vessels of the web of the foot. During the whole period of observation (2 hours), the calibre of the vessels underwent no abnormal change. The principal feature observed was the great tendency on the part of the blood corpuscles to become aggregated in the systemic vessels (veins).

Experiment XXXIV.—A medium-sized healthy male frog was poisoned by the subcutaneous injection into its back of 2 minims of the B. P. tincture of aconite. Stasis immediately ensued as in the preceding experiments. During the period of observation ($1\frac{1}{2}$ hours), the following facts were noted: (1) An absence of abnormal alteration in the calibre of the vessels. (2) That the veno-capillaries gradually became more crowded, and their circulation more stagnant, as the aconitism deepened, and that this aggregation of corpuscles in the veins was much more pronounced in the proximal than in the distal portions of the vessels. The larger veins, in fact, becoming quite blocked. (3) No similar results were seen in the arterioles and arterio-capillaries.

Experiment XXXV.—In this case, results confirmatory of those obtained in the preceding experiment were arrived at.

Experiment XXXVI.—A healthy male frog had the sciatic nerve of one limb divided, and then received a subcutaneous injection into the back of $1\frac{1}{2}$ minims of B. P. tincture of aconite. On comparing the two webs, a great difference was seen to exist in the calibre of the vessels, and the rate of the circulation through them. In the capillaries of the web of the limb whose sciatic nerve had been divided the blood-flow was markedly accelerated, and the calibre greatly increased. These differences continued for one hour from the commencement of the experiment: at this period, the injection was repeated. Ten minutes after second injection, the relative condition of the vessels and circulation in the two webs remained as above, but fifteen minutes subsequently complete stasis gradually ensued in the vessels of the web of the limb whose nerve had undergone section, contrasting markedly with the fair rate of circulation in the vessels of the other web. This relative condition was maintained until the cessation of the experiment ($2\frac{1}{2}$ hours from the period of second injection).

Observations on Experiments.—From these it seems evident that in the aconitized frog the vaso-motor nerves, as tested by observations on the blood-vessels of the web, are uninfluenced by the drug. The calibre of the vessels remained apparently free from abnormal change, and contrasted markedly with that of vessels whose nerves had been previously paralysed by section. In *Experiment* XXXVI. section of the sciatic nerve produced the usual physiological results in the vessel of the corresponding web; but subsequently, when the exhibition of aconite had been repeated with the complete abolition of respiration, and a consecutive interference with the heart's action as results, the circulation became slower and complete stasis eventually ensued, owing to the embarrassed heart having been deprived of the assistance of the vaso-motor nerves in maintaining the blood-current. Throughout the experiment there was no similar evidence of vaso-motor paralysis in the blood-vessels of the other web. The stasis is of a venous character, and is apparently due to pulmonary impediments, for it occurs whilst the heart continues to pulsate, and after the abolition of respiration. These results are confirmatory of those arrived at by Achscharumou, and Böhm, and Wartmann. The latter found that, in aconitized animals, when the vaso-motor centre of Ludwig and Owsjannikow was stimulated by galvanic irritation, the arterial tension was increased. They also showed that similar stimulation applied to a sensory nerve did not produce this result, thus proving that the conducting power either of the afferent nerves or of the cord must be greatly impaired or abolished. In the present series of experiments, it has already been demonstrated that this absence of conductivity is due to paralysis of the peripheral afferent nerves, and not to any affection of the cord.

V.—ACTION ON THE LOCOMOTORY SYSTEM.

Muscular paralysis is never induced by aconite or aconitia. During the development of profound aconitism, and after death, the muscular irritability is great, and contractions readily ensue on the application of mechanical, galvanic, and chemical stimuli. It frequently appears to be increased; for, as already shown in experiments on the nervous system, it remains longer, and is more intense, in frogs poisoned by aconite than in others not so treated.

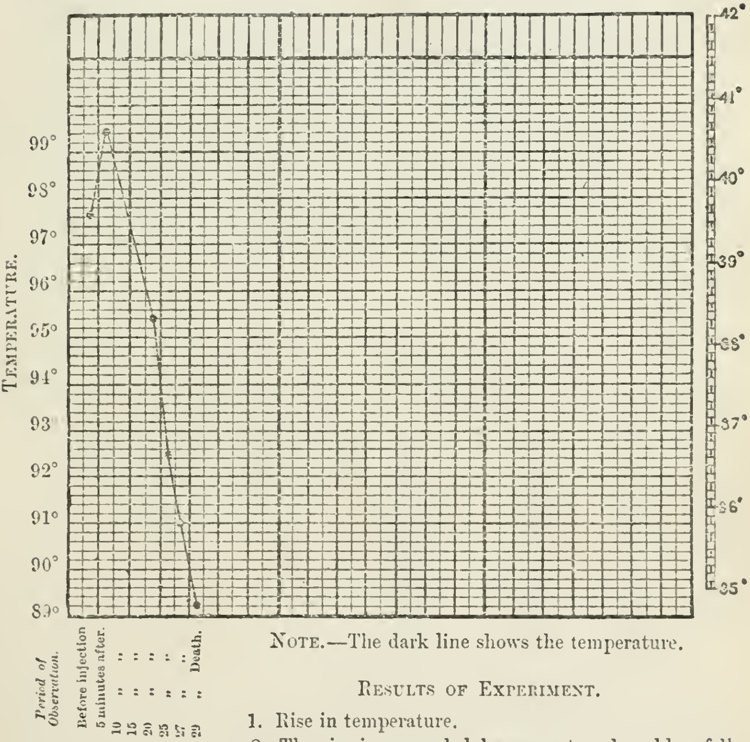
Experiment XXXVII.—Two healthy male frogs of equal sizes were taken, and one only was poisoned by the administration of a lethal dose of tincture of aconite, injected subcutaneously. Both were pithed. Motor nervous irritability, as determined by galvanic stimulation, disappeared from the non-aconitized frog in 40½ hours, and from the aconitized in 43 hours. Muscular irritability disappeared from the non-aconitized in 47 hours: it was present in the aconitized for 72 hours. (See also experiments on the nervous system.)

Remarks on Experiment.—This indicates that both the motor nervous and muscular irritability is increased in aconitized frogs, and is confirmatory of the results already detailed, and which show that the convulsive movements occurring during aconitism are associated with augmented activity of the peripheral motor system.

VI.—ACTION ON THE TEMPERATURE.

The temperature is always markedly affected during aconitism. In the early stages of poisoning it appears to be always more or less increased, and in the latter, diminished, with a

FIG. 1.—Physiological Chart, showing the Temperature of the Ear in the Rabbit, weighing 2 lbs. 6 oz., after subcutaneous injection of $\frac{1}{120}$ gr. Aconitia.

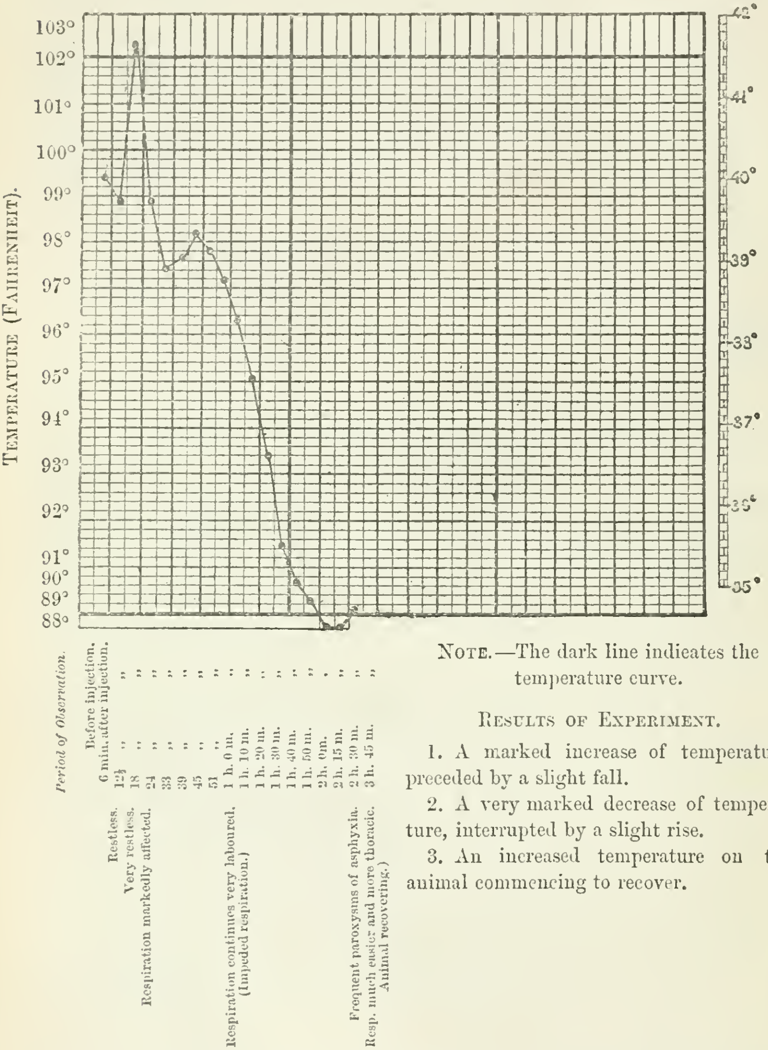


NOTE.—The dark line shows the temperature.

RESULTS OF EXPERIMENT.

1. Rise in temperature.
2. The rise is succeeded by a great and sudden fall, which continues until death.

Fig. 2.—Physiological Chart, showing the Temperature of the Ear in the Rabbit, weighing 2 lbs. 3oz., after subcutaneous injection of $\frac{1}{300}$ gr. Aconitia.



Note.—The dark line indicates the temperature curve.

Results of Experiment.

1. A marked increase of temperature preceded by a slight fall.

2. A very marked decrease of temperature, interrupted by a slight rise.

3. An increased temperature on the animal commencing to recover.

subsequent gradual increase if the dose be not lethal. If death ensue, this secondary increase does not occur. The primary increase occurs during difficult, but not actually impeded, respiration: as soon as the paroxysms of asphyxia ensue, the temperature falls.

Summary of Results of Experimental Inquiries into the Physiological Actions of Aconite and Aconitia.

1. Aconite and aconitia act primarily on the respiration by their influence on the respiratory centre and peripheral sensory branches of the vagus.

2. They have no direct action on the heart, and only affect that viscus secondarily, through the medium of the lungs.

3. Their action on the nervous system consists in, firstly, irritating, and secondly, paralysing, the peripheral sensory nerves and posterior roots of the spinal nerves. They have no direct action on the brain or the vaso-motor nerves. They increase the irritability of the peripheral motor nerves and of the motor columns of the cord.

4. They do not induce muscular paralysis, but, on the contrary, increase the irritability of voluntary muscle.

5. They induce convulsions mainly through their augmenting the irritability of the anterior column of the cord, the motor nerves, and muscles.

6. They firstly increase, and secondly diminish temperature.

7. Death ensues from asphyxia and respiratory collapse.

ON NIGHT COUGH.

BY REGINALD E. THOMPSON, M.D., F.R.C.P.

THE investigation of the inherited tendencies to disease likely to be assumed by individuals is most important to the practical physician if he wishes to obtain a clue to the proper treatment of symptoms which may be indistinct in form, and it is only by being forewarned as to possible proclivities that such symptoms can be appreciated at their proper value.

The inheritance of so comprehensive a disease as phthisis has been generally considered as likely to be assumed *in extenso* by the offspring of a phthisical progenitor, and this may be a convenient aspect for those who assume that phthisis is a diseased entity which can be transmitted from one individual to another; but for those who, like myself, believe that phthisis is a common ending for a variety of diseases that are initiated in various ways and in different tissues, a terminus in fact towards which many different pulmonary diseases converge and in which they ultimately lose their initial distinctions, more discrimination as regards the peculiar features which characterise the phthisical heirloom is especially demanded.

The transmission of disease by inheritance does not necessarily imply the transmission of the complete disease, but may only include a few characterstics of that disease, and hence we find symptoms slight in character and indistinct in form which eventually prove to be modifications of a more serious disease. For example, this is proved to be the case in some trivial forms of localised skin disease which are with much reason attributed to an almost worn-out inheritance of leprosy. By transmission through a number of generations, the disease becomes much modified, and its dangerous and universal development is eradicated.

In investigating the inheritance of a tendency to pulmonary disease, it is not sufficient to establish the previous development of a phthisis, but it is imperative to find out what peculiar forms of phthisis have been established in the family.

The special liability to asthma which is inherited in many families in which a phthisical tendency may be established is one which it is peculiarly important to make out: and the more so as indistinct forms of asthma are sometimes developed in members of such families which cause a good deal of trouble to the patient, and sometimes to the physician if his diagnosis is incomplete.

There is a very persistent and harassing form of cough which accompanies many forms of pulmonary disease—phthisis, bronchitis, and others, which appears to be an undeveloped modified form of asthma.

The patient complains of being much disturbed, at night especially or early in the morning, and it is generally worse when the patient lies down and goes to bed. No narcotics in ordinary use for cough appear to have any effect, and it is only by asthmatic remedies that any relief is obtained. Many cases of this kind have now come under my notice which formerly used to trouble me not a little from the constant complaint that was made as to the distress arising from this obstinate night cough and the ineffectual result of opiates. In all those cases of this kind which I have lately investigated, there was a decided history of inherited asthma; but it will be sufficient if I quote two cases out of the number.

A lady, who had been confined three weeks, consulted me about a very persistent and harassing cough which kept her awake through the night. For this, various remedies had previously been tried, opiates chiefly, without the slightest alleviation. A year before this, her younger sister had applied to me for advice for a fully developed asthma which was treated successfully by asthmatic specifics. The remembrance of this gave a clue to the case, and investigation proved that asthma had been inherited from a grand-parent, the father and mother of the patient having been perfectly free from pulmonary complaints. Relief was at once obtained by Joy's cigarettes, which are often extremely useful in like cases.

A young lad, aged 9, was brought to me for advice respecting a persistent cough with which he had been troubled since an attack of measles eight months before. On examining him, I found a thickened condition of the alveolar tissue and harshness of respiratory murmur which appeared to depend upon an old condition of broncho-pneumonia. I ordered him some cod-liver oil and lactuca for his cough, but finding that the cough was still very troublesome, especially at night, I conjectured that the case was one of undeveloped asthma, and on investigation I found that the grandfather had been subject to asthma. In this case the burning of nitre-papers removed the cough at once.

In none of these cases are there any nocturnal attacks of dyspnœa, so that the asthmatic nature of the symptoms is often indistinct; but the treatment by asthmatic specifics is so efficacious that there can be little doubt as to the appropriate remedies required, and until such remedies are administered the cough remains unalleviated.

ON ACUTE BRONCHITIS.

BY D. J. HAMILTON, M.B., F.R.C.S. ED., L.R.C.P. ED.,

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(*Continued from* p. 98.)

After the columnar epithelium has been shed, the deeper or germinal layer comes into view, and although this may likewise here and there desquamate, its absence is only of temporary duration and limited to small areas, the denuded portions being apparently very rapidly covered by the neighbouring cells. The whole epithelial covering then assumes quite a different character from that met with in health. So long as the congested state of the parts exists no true columnar cells are produced, and the only attempt at their regeneration is exemplified in the formation of the transitional forms met with in the deeper layers. We then find the bronchial mucous membrane having the appearance represented in Fig. 20, the duration of the attack in the person from whom the bronchus was taken being in all probability about ten days, although we should say, from comparative observations, that the actual part of the mucous membrane represented in the figure was advanced only to the third or fourth day of the catarrh. The same congestion will be seen as in Figs. 18 and 19, but it will now be noticed that it not only affects the inner fibrous coat, but that all the parts of the bronchus exhibit vessels over-distended and engorged with blood. On looking at the surface, no vestige of the proper columnar epithelium is visible, its place being taken by the pyriform or battledore-like cells found in the deeper strata of the normal epithelial investment. In no case, however, have we ever found the epithelial covering entirely wanting throughout the whole transverse section of a bronchus, and we shall see that it is this which gives to the secretion its peculiar catarrhal characters. It is not the want of epithelium which is the fault, but rather that the wrong kind is produced, having more or less of an embryonic

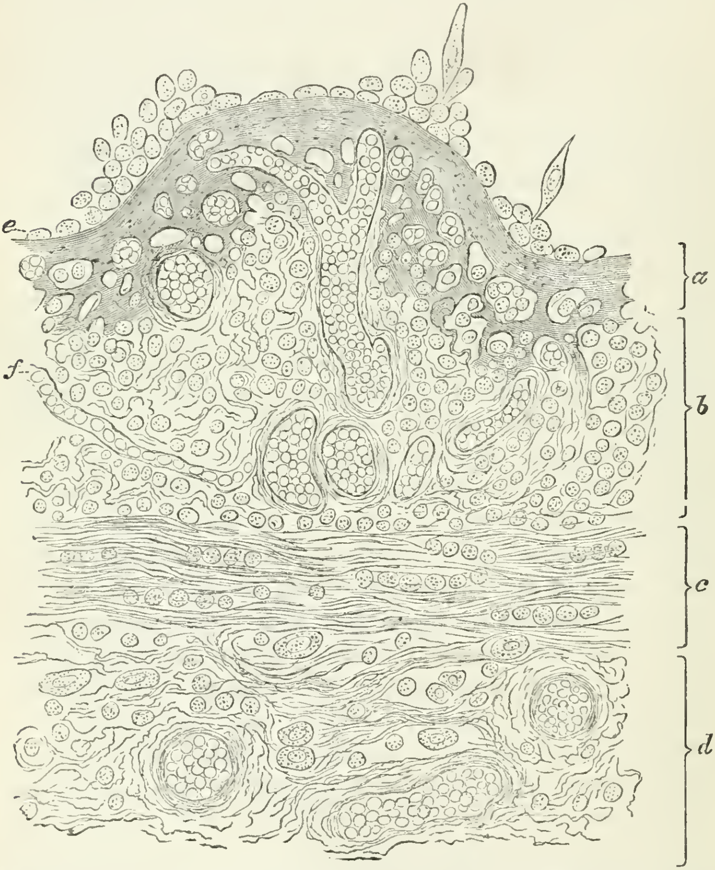

FIG. 20.—Section of entire bronchus. Acute bronchits—× 480 Diams. *a*, basement membrane; *b*, inner fibrous coat; *c*, muscularis; *d*, outer fibrous coat; *e*, catarrhal cells.

character. The shape of these abnormal cells is either pyriform, oval, or more or less polygonal, and usually those which lie deepest can be detached in scales from the basement membrane. They are all highly nucleated, and in process of fissiparous division. The flat cells nearest the basement membrane seem to divide first, and very soon the resulting segments rise above its surface (Fig. 18, *e*), being, at first, pyriform, with the slender extremity attached. When this slender extremity has become more and more attenuated, it gives away and they are thrown off into the lumen of the bronchus as catarrhal cells. This process goes on with great rapidity in some parts of the bronchial wall, as seen in Fig. 18, where a great mass of such catarrhal cells has accumulated on the surface. When these catarrhal cells are set free, they become more or less oval or rounded, and very frequently pass into a state of fatty degeneration. They become enveloped in a quantity of the mucus which is constantly being poured out from the orifices of the mucous glands, and together with this constitute what we understand as a catarrhal secretion. The more watery consistence which this has in the early stages of the disease is probably due to an admixture of serous fluid which has escaped from the œdematous mucous membrane, and the yellow colour and tenacious consistence that it assumes at a later period are due to there being less of this serosity and more cellular structures. This abnormal formation of an embryonic epithelium continues so long as the congestion and œdema of the mucous membrane lasts, and the cause of it seems to be the over-stimulation of the epithelial surface, probably from the amount of blood plasma supplied to it. The cellular proliferation goes on so rapidly that there is no time given for elongation and moulding into the complete columnar cell such as we have seen takes place normally; but instead, the divided segments are thrown off in the shape of catarrhal cells as soon as they are formed. Similar processes apparently go on in the mucous glands, especially at their mouths, but not by any means so markedly as on the surface of the mucous membrane itself; they are chiefly concerned, we shall see, in the elaboration of the mucin-holding fluid in which the cells lie. It has been asserted by Rindfleisch and others, not apparently from direct observation, but by analogous comparison with other tissues, that the catarrhal cells are proliferated connective tissue corpuscles, which have escaped on the surface. We have never seen any evidence of this in acute bronchitis, the basement membrane seeming to form an impenetrable barrier through which they cannot pass; and even in chronic bronchitis, where this structure becomes much attenuated, we have never seen any direct and clear evidence that they pass through it. There is always a well-marked boundary line between the catarrhal proliferating surface on the one hand, and the infiltrated inner fibrous coat on the other.

While these changes have been going on in the epithelial surface, processes no less striking have been advancing in the substance of the mucous membrane itself. These consist in the dilatation of the vessels, and the infiltration of the inner fibrous coat with cellular structures. The intervals which naturally exist between the fibres of the inner fibrous coat, and which, in silvered preparations, are seen to constitute a rich system of lymphatic vessels and plasma spaces, lined with an endothelium and containing so-called connective tissue corpuscles, are now crowded with small round cells, which we shall call leucocytes, irrespective of their origin; and also with cells of a larger size, more irregular shape, and highly nucleated. They have evidently been in active amœboid motion during life, and run in rows from the basement membrane outwards towards the interspaces between the cartilages and glands, finally making their way into the outer fibrous coat. They are certainly most abundant round the blood-vessels, and, at first sight, one would naturally conclude that they were colourless blood-corpuscles which had exuded. And although there seems little doubt that, as the inflammatory irritation increases, as the vessels become more and more distended, the leucocytes do exude in large numbers, yet it is also quite evident that this is not the only source of this intense cellular infiltration. For if the inner fibrous coat be carefully examined in an early stage of acute bronchitis, the flat endothelial cells and connective-tissue corpuscles which lie in it, especially the former, can be noticed to enlarge, their nuclei, which previously were not particularly evident, have now increased in size, and, frequently, there are two or more of such in a single cell. The appearance is somewhat like that seen in Fig. 20, *d*, and also in Fig. 21, which, however, are portions of the outer fibrous coat in which the same process is advancing, and in which the flat endothelial cells normally covering the bundles of fibrous tissue, are seen in an active state of endogenous nuclear formation and fissiparous division. The nucleus first becomes prominent and very finely granular, it then elongates and divides into two or more segments, and, coexistently with this, the cell-body becomes hour-glass shaped and similarly divides.

Sometimes three or four nuclei are formed endogenously at one time, and then the cell breaks up into as many separate portions, each portion becoming in its turn rounded and larger, and frequently again undergoing similar endogenous nuclear proliferation and division. The larger highly-nucleated cells seen in the inner fibrous coat, of irregular shape, are undoubtedly formed in this way, while the cell most often noticed, that is to say, a small round cell like a colourless blood-corpuscle, is either the result of this endogenous formation and fissiparous division carried to an extreme degree, or it is simply a colourless blood-corpuscle which has made its way outwards through the coats of a distended blood-vessel.

As a result of these two processes the inner fibrous coat, in from thirty-six to forty-eight hours, begins to show long rows of small round cells, stretching outwards to the inter-cartilaginous and interglandular spaces, and passing between its fibres into the outer fibrous coat. It is evident that they are travelling actively, from the various oval and spindle-like shapes which they sometimes assume, and from the fact of their following each other in long rows between the bundles of fibrous tissue. In a short time afterwards, probably in the fourth to the fifth day of an acute catarrhal attack, the cellular infiltration becomes very much greater, and then we find the whole of the lymph spaces entirely choked up by the new cellular products which lie within them. That the direction in which they spread is outwards can be easily verified, but that they ever get to the free surface of the bronchial mucous membrane, and are discharged into it, we do not believe to be the case in acute bronchitis. It will be well, however, to examine the evidence on which this statement is founded before going further, and for this purpose, we must look at the basement membrane as it is presented to us from the fourth to the fifth day of an acute catarrhal attack, that is to say, by the time the spaces between the fibres of the inner fibrous coat are distended with cellular structures. We have seen that this basement membrane in health is a most delicate, apparently elastic, membrane, underlying the epithelial covering, but if we look at it in Figs. 18, *b*, 19, *d*, and 20, *a*, which represent bronchi in an acute catarrhal condition, we should have some difficulty in recognising it as the same structure. Instead of being a thin delicate membrane, only visible with high powers, it has now become an extremely prominent object, easily seen with a magnifying power of fifty diameters, and forming a homogeneous layer which underlies the proliferating epithelium. The reason why it is now so evident is, apparently, that it has become intensely œdematous. Not only, however, does the membrane itself come prominently into view, but its connections with the underlying inner fibrous coat are now rendered very evident. These consist of numbers of branching processes, previously quite invisible, running downwards and losing themselves, apparently by becoming continuous with the fibres of the inner fibrous coat, and evidently forming a continuous attachment of the basement membrane to the latter (Figs. 18 and 20). On examining the basement membrane at this period of a bronchitis, even in this œdematous condition, when it might be thought that any cellular structures which it possessed would have been rendered unusually prominent, we have never been able to make out that any such were contained within it. It appears perfectly homogeneous, unless at its deeper attachments, where it becomes faintly fibrous (Fig. 18). Were it the case that leucocytes made their way through it, and were cast off on the free bronchial surface, they ought certainly to have been visible in this transparent condition of the basement membrane. We have never, however, been able to see these in acute bronchitis, and do not believe that such diapedesis takes place, nor that the cells of the catarrhal secretion are derived from this source. The course which they invariably pursue after they infiltrate the inner fibrous coat is outwards, along the line of the peri-bronchial lymphatic vessels. Its peculiarly homogeneous structure, great thickness, and the fact of there being no interspaces visible in it, all go to favour the view that the basement membrane is the line of separation between what is epithelial and what belongs to the substance of the mucosa itself; and we shall see that even in the most severe and protracted cases of bronchiectasy this basement membrane is never absent, but always maintains its character as a boundary between that which is epithelial and that which is not.

We must now trace what changes have taken place in the other parts of the bronchi, for, if the attack has lasted for any length of time, these always become the seat of the most marked alterations. The wide interspaces which exist between the bundles of muscular fibres are usually filled with leucocytes (Fig. 20, *c*), but the muscular fibres themselves do not present any change. In the outer fibrous coat there are invariably seen, after a few days, changes co-existent with those in the mucosa. On referring to Fig. 14, we see that the bundles of wavy fibrous tissue found in the outer fibrous coat, or adventitia, of the larger and smaller bronchi have lying upon them, every here and there, large, oval, or flat cells which have a spindle shape when seen on edge and may be looked upon as connective tissue corpuscles, or endothelia, according to the view taken of the matter. It is specially in these cells that a sympathetic change takes place when the bronchi are the subject of acute or chronic catarrh, a change apparently analogous to the lymphatic disturbance of distant parts in inflammatory irritation of the skin. The first alteration appreciable in them is that they become unnaturally prominent and finely granular (Fig. 21); the nucleus then enlarges, and frequently contains a vesicular nucleolus. It further becomes hour-glass shaped, the depressions on each side deepening until a complete separation into two parts ensues. This is followed, shortly afterwards, by a similar division in the periplast of the cell (Fig. 21, *a*), and the resulting portions form two round catarrhal-looking cells, with finely granular protoplasm, and usually several vacuoles contained within them. These further subdivide in a similar manner, and then we get, either in the adventitious coat, or in the neighbouring processes running off to meet the lobular septa, areas in which large collections of different-sized actively dividing cells are to be seen. The ultimate result of this proliferation seems to be the production of leucocytes, and when the subject of chronic bronchitis is considered the future history of these will be demonstrated, and we shall then perceive that one of the great dangers of an acute bronchitis is this proliferation going on in the neighbouring fibrous attachments. The proliferation is not, however, confined to the immediate vicinity of the bronchi, but soon spreads throughout the lobular septa to the deeper layer of the pleura, the whole of the lymphatic vessels evidently becoming the subject of a catarrh, much the same as that of the bronchi themselves. The changes just described are always most active where there is some congestion, the centre of an actively proliferating area usually containing an artery overdistended with blood corpuscles, or holding a fibrinous plug in its centre (Fig. 21, *c*).

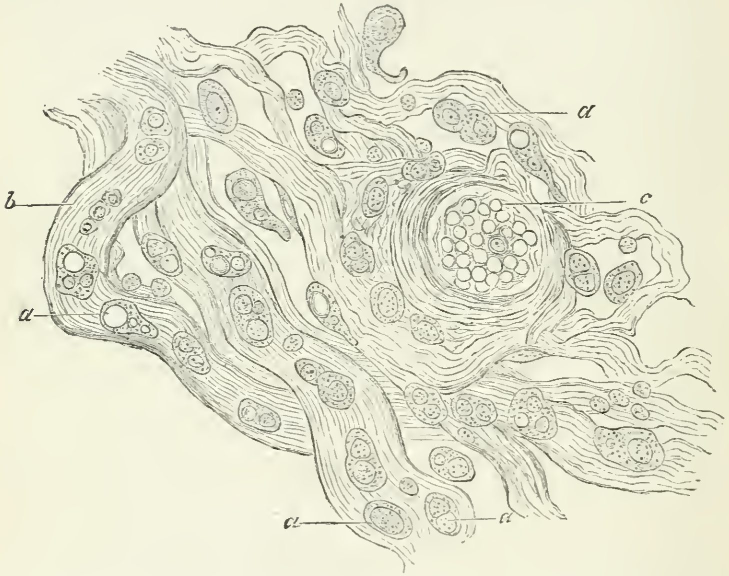

Fig. 21.—Peri-bronchial fibrous tissue. Acute bronchitis—× 480 Diams. *a*, endothelial cells dividing and containing many nuclei and vacuoles ; *b*, bundles of fibrous tissue ; *c*, congested blood-vessels.

We have, up till now, considered the changes in the mucous membrane apart from the mucous glands that are contained within it. We have seen that in their structure these glands are to be looked upon as nothing more than processes of the ordinary basement membrane and its epithelial covering, the duct of the gland being lined by both the superficial and deep layers, the fundus being covered by the deeper layers alone, which constitute the secreting elements. The primary congestion which is noticed in other parts of the mucosa, in acute bronchitis, is usually a very prominent feature in the mucous glands, and seems, as in the former, to be the first visible alteration. The next appreciable change seems to be the desquamation of the epithelium lining the mouth and neck of the duct, which is usually seen lying detached in or near the neck, enveloped in a tough plug of mucus. The cells are usually fatty, and in other respects this desquamation is identical with that seen on the free surface of the mucosa itself. The deeper layers of the epithelium, however, are left adherent to the basement membrane, and are seen to be actively proliferating. Similar desquamation seems to ensue in the deeper portions of some of the glands, the desquamated cells becoming very cloudy and granular (Fig. 22, *b*), but in the majority of them an entirely different appearance is presented. This is shown in Fig. 23. It seems to be much the same as Heidenhain has described in

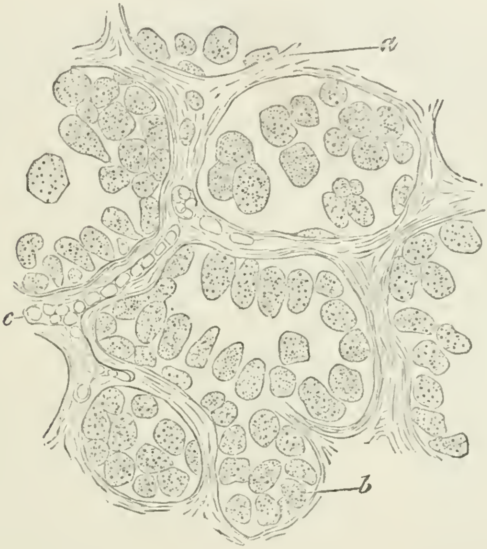

FIG. 22.—Section of a mucous gland. Acute bronchitis—×480 Diams. *a*, stroma of gland; *b*, secreting cells desquamating; *c*, congested blood-vessels.

the mucus-forming cells of the salivary glands. It can be seen that the whole of the epithelial cells lining the alveoli of the gland are perfectly transparent, their somewhat dark outlines merely sufficing to show the borders of the cells. The cell is also swollen, and its shape altered, while no nucleus is usually to be seen in it. The cause of this is undoubtedly the accumulation of mucus within the cell, from excessive secretion, and all stages of infiltration and consequent transparency can be noticed, from where, at first, there is a mere clearing up of the natural granularity of the cell at one spot, to where it comes to have the appearance represented in the figure. A few catarrhal cells are noticed on the surface, and underlying the transparent swollen

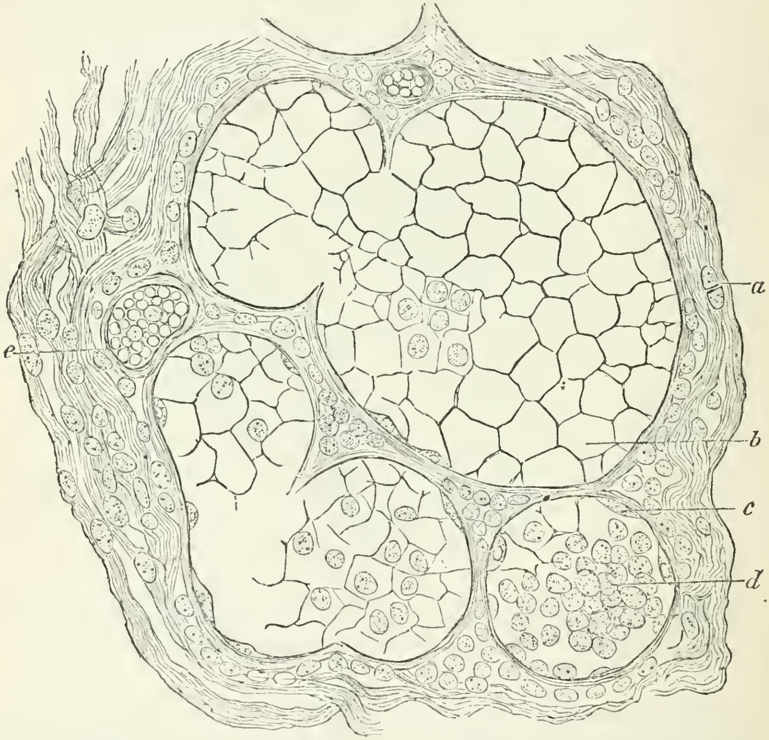

FIG. 23.—Section of a mucous gland. Acute bronchitis—× 480 Diams. *a*, cells dividing in the stroma; *b*, secreting cells distended with mucus; *c*, flat cell layer of epithelium underlying the secreting cells; *d*, catarrhal cells lying in the cavity of the glandular alveolus.

mucous secreting cells an evident flat cell layer (Fig. 23, *c*) can be observed on perpendicular section, the nuclei of the cells causing them to have a somewhat spindle shape. The whole of the appearances seen in connection with the gland go to indicate that the part they take in the formation of the catarrhal discharge is the secretion of mucus, and that although they certainly assist in the production of the catarrhal cells, they are not the source from which the bulk of them is derived. These, which are formed from the ordinary epithelial covering of the mucous membrane, merely become mixed with the secreted catarrhal mucus, and the combination of the two gives rise to what we understand as a yellow muco-purulent fluid. The connective tissue corpuscles in the stroma of the gland were observed in an active state of division, and long rows of leucocytes were seen wandering between the bundles of fibrous tissue (Fig. 23).

The lymphatic glands at the root of the lung were invariably enlarged, and on minute examination the endothelial-like cells lining the stroma were seen actively dividing. The whole of the lymph paths were choked with catarrhal-like cells, similar to those seen in the lobular septa, and the number of leucocytes seen in the gland was increased to an inordinate degree. The vessels were all deeply congested, and, in one or two instances, commencing caseation was noticed at the centre.

Hæmorrhages were also very frequent, and were found in the outer fibrous coat and basement membrane in almost every case of acute bronchitis we examined. In some instances they were of considerable size, and, when they occurred in the latter situation, they produced a solution of continuity, with discharge of blood, into the bronchus.

The state of the ganglia and nerve trunks was very interesting both in acute and chronic catarrh. The ganglia in the lung are abundant round the large bronchi at the root, and were originally described by Remak, and more lately they were the subject of a paper at the British Association for 1876, by Dr. W. Stirling. Their function has never been clearly indicated, although judging by analogy, one would suppose that, like the similar structures found in salivary and other glands, and in the stomach, they are concerned in secretion. The only other function that might be attributed to them is in the regulation of the muscular fibres of the bronchi or those in the walls of the bronchial arteries; for, notwithstanding that the pulmonary artery does not seem to be subject to the same laws of vasomotor action as other arteries throughout the body, there is no reason to believe that the bronchial arteries are to be included in the same category. The fact of their being so numerous looks, however, as if they had surely some other function than this, and the appearance they have in acute bronchitis, when the glands of the mucous membrane are abnormally active, would favour the idea of their being concerned in the secretion of mucus. A representation is given of one of them in Fig. 24 taken from a child who suffered from acute bronchitis after whooping cough; and although it might be urged that the abnormal amount of congestion seen in it and its neighbourhood might have had something to do with the essentially spasmodic nature of the disease, yet this seems discredited by the fact of

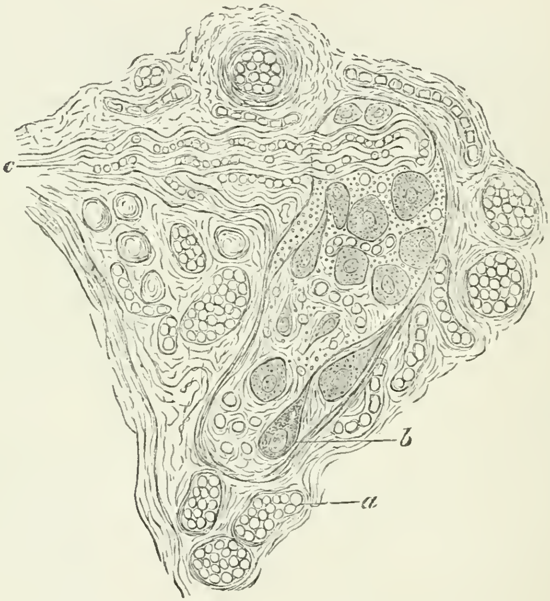

FIG. 24.—Section of a bronchial ganglion. Acute bronchitis— × 480 Diams. *a*, congested blood-vessels around ganglion; *b*, ganglion cells; *c*, congested capillaries of nerve trunk.

its being equally great in other cases either arising idiopathically or as sequelæ to certain febrile conditions. There was always noticed the most intense congestion of the surrounding vessels, and the minute capillaries which ran into the ganglion and nerve trunks were all engorged with blood. We cannot say, of course, that the congestion of the ganglia and the hypersecretion of mucus were cause and effect, but we would merely suggest it as probable that the over-excitement of these nerve-centres may have had something to do with it. Had they been concerned in vaso-motor action it might have been expected that their over-stimulation would have given rise to spasmodic contraction of the muscular coat of the *bronchial* arteries. Such, however, was not the case, one of the most marked phenomena being, as previously indicated, dilatation and evident exhaustion or paralysis of the muscular coat. The excitement of mucous secretion from the bronchial, tracheal, and nasal mucous membranes, on the stimulation caused by mere sudden variations in temperature, would point also to its being in all probability a reflex phenomenon, and it seems only reasonable to suppose that as the ganglia are so intimately associated with those bronchi in which mucous glands are formed, they are possibly the immediate centres for that reflex act.

The first indication of recovery taking place in acute bronchitis, seems to be the diminution of the congestion of the mucous membrane. The vessels seem to recover their wonted tone, and the circulation goes on more freely. Simultaneously with this, the excitement of the epithelial surface seems to diminish, the proliferation of the epithelial cells becomes less active, and, instead of their being thrown off in an embryonic condition, as a muco-purulent secretion, they are again converted into fully-developed columnar cells. The process by which this is accomplished is identically that described in their formation, and, little by little, the epithelial covering assumes its normal appearance. The cellular infiltration of the wall of the bronchus is got rid of apparently by means of the lymphatics, but, in cases which become chronic, we shall see that this absorption causes great surrounding irritation, ending in the formation of more or less interstitial pneumonia.

(*To be continued.*)

A CAUSE OF ALCOHOLISM WITH THE TREATMENT SUGGESTED.

BY F. P. ATKINSON, M.D

Kingston-on-Thames.

THE more one inquires into the various hereditary tendencies, the physical and mental causes at work, together with the prevailing ignorance with regard to nature's laws, the more is one inclined to make allowance for man's various delinquencies. Look, for instance, at some of the causes of alcoholism, and see whether we can feel otherwise than compassionate towards many who are the subjects of this terrible disease. Hereditary influence plays a very important part in its causation, as does also anæmia of the brain—a feeble action of the heart, and low nervous power generally ; and I have no doubt many partially excusable causes are yet to be discovered. I have lately seen two cases which I think may be by no means uncommon. One patient came to me when the habit was already confirmed, and the result was, I am sorry to say, unsatisfactory. The other, before stimulants were regularly resorted to, and inasmuch as the treatment suggested gave decided benefit, that which would soon have grown into a habit was checked in its very commencement. Both patients were married men (one of moderate, the other of immoderate sexual desires); the symptoms in both were the same ; and in both they were produced by the same cause. The chief symptom complained of was a sinking or feeling of void at the pit of the stomach, which they said nothing seemed to relieve but stimulants, and these very temporarily. At first not thoroughly understanding the nature of the case which was presented to me, and thinking the cause was due to some ferment in the stomach or sarcina, I ordered carbolic acid, hyposulphite of soda, and sulphurous acid, without the slightest relief being obtained from either. Finding, however, upon inquiry, that this feeling came on about three or four hours after connection, I judged that it might be the result of nervous exhaustion, and acting upon this supposition, I prescribed some pancreatic emulsion, some of Kirby's compound phosphorous pills, Bravais' dialysed iron, &c., but with only partial benefit. It subsequently struck me that feebleness of the heart's action (common to both patients) might possibly have some share in producing the symptom complained of, and I ordered 40 to 60 drops of sal-volatile every four hours on the days when it occurred, together with large quantities of milk. The relief experienced from this treatment was very decided in the second case, and the reason of its being so is, I think, very clear. The milk and ammonia both supply food to the brain, and the latter is a good cardiac stimulant. From experience gained in these two cases, I should say that alcohol is decidedly injurious, and likely, if indulged in, to lead to serious results. I sincerely hope that these few remarks, short though they are, will afford some slight guidance to those who may be called upon to treat cases of a like nature, and help, even if only to a small extent, to prevent the increase of alcoholism.

CALABAR BEAN IN IDIOPATHIC TETANUS.

BY REGINALD BLIGH READ, M.D., SYDNEY.

THE few brief notes I now send on the value of large doses of Calabar bean in a case of idiopathic (?) tetanus in a lad æt. 12¼, would I think have had much interest for my valued fellow-student and friend, poor Anstie. The only history I obtained was that of a fall the previous June or July; on 26th September a shivering fit whilst in school; on 28th a severe wetting and chill; on 30th a stiff neck; seen by me on 4th October, at 4 P.M. General tetanus supervened on the evening of the 7th October, but yielded readily to chloral hydrate given by the mouth and per anum, but which soon ceased to produce the desired effect. On the 10th at 4 P.M. he was given alcoholic extract of Calabar bean. As I was at the time overwhelmed with other urgent engagements, and the patient resided a long way from my house, I could not superintend the administration of the bean, and so I only gave 1 gr. of the extract every four hours. This proving satisfactory, the dose was increased to 1½ grs. The rate every twenty-four hours was then rapidly increased to 23, 45, 60, 82, till it reached 90 grains, when the disease appeared to have reached its crisis, and three hourly doses of 3¾ grs. each were omitted, and at 8 P.M. of 25th October, 2½ grs. were directed to be taken, and an extra dose of this quantity had to be given. Every attempt to reduce considerably the quantity of the bean taken was unsuccessful, and great difficulty was experienced in reducing the dose to 60 grs. daily, on 26th and 27th and part of 28th. The extract used up to the 18th was from Blackfriars, afterwards that prepared by Ransom of Hitchin, and was given by the mouth. The largest quantity actually taken in twenty-four hours was 83¾ grs., and I gave in twenty minutes on one occasion 7½ grs.

In this case the perspiration I attribute entirely to the tetanic spasms, as invariably when brought under full doses (for him) of the bean *all* perspiration was checked. The temperature was also lowered; at 9 P.M. of the 26th, consequent on a violent return of all the symptoms, I gave the 7½ grs. in twenty minutes. At 10 A.M. of that day the temperature in the rectum was 103·2, p. 120. At 8 A.M. of the 27th, the temperature in the rectum was 99·5, pulse 94. The bean also checked the frothy mucus in the air-passages, the salivation it produced being quite distinct. Comfortable decubitus and easy sleep, from which he readily roused when I spoke to him, and the ability to take large quantities of nourishment, were also owing to it. Only when under the influence of very large doses could contraction of the pupil be obtained. No matter what the dose, he *never vomited*, though once or twice when first given he would say he felt sick. Rarely did he complain of pain in the bowels, though free evacuations were daily obtained. When the doses were first increased to 2¼ grs. every two hours, the bean produced an intoxicating stage with very rapid breathing, which could hardly at any time be called stertorous, but rather hysterical; a few intermissions, say five, of the rapid breathing would occur, and then the quick inspirations would be resumed: this would continue until the respirations slowed down to such an extent that the parents several times thought the lad was gone. This stage lasted five minutes. On altering the dose to 1 gr. an hour this effect disappeared, though I could always see that there were traces of it after every dose, but not very great even when the dose was 3¾ grs. every hour. Urine scanty and bowels freely opened throughout. As much nourishment given as possible. On one or two days he complained of toothache, so I removed a canine milk tooth, over which the new one was growing out; this relieved the neuralgic pain. Intellect very clear, and he chimed in with any conversation going on, though whilst in the stage of intoxication he would be slightly delirious. The highest temperature in the rectum was on the 24th, when the thermometer marked 104·6, whilst pulse was 140. This day appeared to be the crisis of the disease. On October 11th, herpes labialis appeared, which disappeared on the 19th, and was followed on the 20th by an eruption on the back of solitary vesicles as large as a pea, evidently enormous sudamina, which spread to the chest, then neck, face, and head, then to the palms of the hands and soles of the feet, causing great itchiness. At first glance he looked like a small-pox patient. I consider them *herpetoid*, and to be the effect of the disease and not of the bean. From the time the general tetanus supervened I had the able assistance and advice of my friend Dr. Marshall of this city, who followed the course of the case with unflagging interest.

At 10.10 A.M. this morning, the 28th October, the sufferer expired with a single sigh, but cheerful and sensible to the last. The temperature in rectum an hour before death was 104, of the skin 102·1; pulse 118; respiration 40, accompanied by large mucous râles, which have shown themselves occasionally disappearing since the 23rd. No post-mortem allowed. Death from exhaustion occurred on the 29th day of tetanus, or 33rd day from the shiver. There seems much in this case to cause me to consider it as an intermediate one between tetanus and cerebro-spinal fever. When large doses of the bean were given I devoted all the time I could possibly spare to this case, otherwise would have sent you fuller notes, but being much worn out myself will send them at a later period, should you wish them.

The additions of the doses having been made up, I have just time to add them here.

				Grains.
10th	October,	4 P.M. to midnight	inclusive,	3
11	,,	,,	,,	7
12	,,	,,	,,	$16\frac{1}{6}$
13	,,	,,	,,	$18\frac{1}{9}$
14	,,	,,	,,	$16\frac{9}{16}$
15	,,	,,	,,	$25\frac{5}{8}$
16	,,	,,	,,	$21\frac{1}{4}$
17	,,	,,	,,	$17\frac{1}{2}$
18	,,	,,	,,	$31\frac{7}{16}$
19	,,	,,	,,	$41\frac{9}{16}$
20	,,	,,	,,	$47\frac{1}{4}$

					Grains.
21st	October,	4 P.M.	to	midnight inclusive,	$56\frac{5}{16}$
22nd	,,	,,		,,	$66\frac{5}{8}$
23rd	,,	,,		,,	$75\frac{1}{16}$
24th	,,	,,		,,	$68\frac{3}{4}$
25th	,,	,,		,,	60
26th	,,	,,		,,	$52\frac{15}{16}$
27th	,,	,,		,,	$65\frac{5}{8}$
28th	,,	,,	9.15 A.M.	,,	$17\frac{1}{2}$
				TOTAL	$707\frac{417}{434}$

From 4.15 P.M. of October 23rd, to 4 P.M. of 24th, $83\frac{3}{4}$ grains taken.

ON ACONITE AS A THERAPEUTICAL AGENT, ESPECIALLY IN THE TREATMENT OF ACUTE INFLAMMATION.

BY JAMES S. SPARK,

Surgeon to Millom Ironworks, etc.; Formerly Parochial Medical Officer, Port of Menteith, N.B.

There are few, if any, of the many drugs which have come into use, or been prominently before the profession, of late years, more deserving of notice, or more useful to the general practitioner, than aconite. But though so much has been done by Fleming and others, in investigating its physiological and therapeutical action, and every now and then our attention is called to some new case in which it has been found of service, it is surprising how little it is employed by practitioners throughout the country. There are many inflammatory affections where its effects are literally marvellous, not only from the efficacy, but also from the rapidity of its action, cases in which none of the usual *routine* drugs operate either so unmistakably or so efficiently, if indeed they do more than, to some extent, control the symptoms.

The most remarkable, as well as the most valuable, effect of the administration of aconite, is due to its power of *aborting* inflammatory action, if prescribed sufficiently early. I say the most valuable, because, although it is a great matter to be able to control inflammation, it is of much greater importance to be able to arrest or prevent it; and this power we can claim for aconite.

It is not my intention, in these few remarks, to enter into an examination of the physiological action of the drug, or to describe the mode of its action in disease, but merely to call attention to its remarkable efficacy in certain affections, and to refer briefly to some of the cases in which I have found it of signal service. My remarks are written purely for a practical purpose, and for the benefit of the busy practitioner.

The first disease to which I shall direct your attention, in which I have seen illustrated the abortive power of aconite, is pneumonia, and if it were the only affection which aconite could not only control, but also cut short, its gravity is such that we should be warranted in giving the drug a prominent place in our pharmacopœia. If administered within a day or two after the symptoms are apparent enough to render the diagnosis certain—but of course the earlier the better,—it will arrest the inflammation and effect a cure in from one to three or four days, the beneficial effects being manifest from the very commencement of its administration. The pain frequently begins to subside from the first, the skin becomes moist, the breathing more natural, and the patient appreciably better and more comfortable after each dose. I have used it frequently both in children and adults, and have never seen it fail to produce most satisfactory results. The dose I have generally employed for an adult is 5♏. (Fleming's Tincture) at first and 1 or 2♏. every hour after, modifying the dose according to circumstances. If the patient be debilitated from any cause, it must be prescribed cautiously, as I have seen it cause considerable alarm by producing delirium, nor are the beneficial effects of the drug any more, if so much, seen when it acts too powerfully.

I have not had sufficient experience to speak positively of its action in bronchitis, but so far as I have seen, it does not appear to exercise the same control over it as over pneumonia. I have however found it useful when there is much feverishness, with fulness of the head and flushing of the face. One reason why it has not proved so useful in bronchitis, as in many other affections, very probably is that we have not so generally an opportunity of treating bronchitis at the commencement of the inflammatory stage.

In cynanche tonsillaris I have found it exceedingly useful, both as an abortive and as a controlling or modifying agent. If properly administered during the inflammatory stage it will seldom fail to cut the attack short, and, if given at the very beginning, to abort it. If duly administered it not only cuts short the present attack, but after a time it seems to reduce or remove the liability to quinsy, in persons subject to periodical attacks of it. It would take a considerable deal of evidence to establish this last fact, but I have seen it sufficiently often to warrant my referring to it.

I have not used it in croup, but Ringer says that the good effects of it, in the catarrhal form of that malady, are as conspicuous as in quinsy.

Its use in fevers, especially in those of an inflammatory character, has been found very advantageous. It reduces the temperature and produces a very soothing effect from its action on the skin. Whether it will act as an abortive in such cases, or not, if given sufficiently early, I have not yet ascertained, but have every reason to believe it would.

It has been strongly recommended in acute rheumatism, but I have not found the effects so satisfactory as those from the use of actæa racemosa.

There is no doubt of its efficacy in erysipelas, especially in that form which is occasionally consequent upon vaccination, which I have seen it cut short in a few hours.

There was a case lately quoted in the *Practitioner* where its administration in frequently repeated doses aborted milk abscess in twenty-four hours, and, though I have not yet tested it, it is, by analogy quite what I should expect.

We have no better illustration of the efficacy and rapidity of the action of aconite than in common cold, "cold all through one," or "cold in the bones," as it is variously popularly described, when one feels as if he had been put "through a thrashing mill." Ringer (I think) states that one or two drops taken at bedtime will enable a person in such a state to rise quite well in the morning; and certainly in the doses I have mentioned it affords very speedy relief.

It relieves that disagreeable affection, ringing in the ears, in many cases after a dose or two, and is said also to remove earache.

In the acute stage of gonorrhœa, when there is much pain and uneasiness, it affords marked relief.

There is one precaution in the use of it, to which Ringer directs attention. It is, he says, contraindicated in inflammatory affections where the temperature of the body is not above natural, so that in doubtful, and indeed in all, cases it is advisable to use the thermometer before prescribing it.

It is recommended in many other affections besides those I have referred to. I have called attention to those chiefly in which, in my own experience, I have found it invaluable. For a fuller account of its action and effects I cannot do better than refer my readers to Ringer's excellent *Handbook of Therapeutics,* than which, and especially the last edition, there is no book in the language more useful to the general practitioner.

Reviews.

Handbook of Therapeutics. By SYDNEY RINGER, M.D., Professor of the Principles and Practice of Medicine in University College. Seventh Edition. 8vo. pp. 647. London: H. K. Lewis.

THE appearance of another edition of this work within a year of the last shows that its popularity is still increasing, and the author has added still farther to its value by chapters on the tongue, pulse, skin, and temperature, and the indications they afford for treatment. For the hints contained in them many a one will be grateful, the need for them having been often felt. A chapter has also been added on the action of nitroglycerine. This is mentioned as a remedy in angina pectoris, but experiments which we have made along with Mr. Tait show it to have much less power to lessen the blood pressure than nitrite of amyl, while it causes such severe headache, even in minute and indeed almost imperceptible quantities, that its investigation is by no means pleasant work, and it appears problematical whether its medicinal uses will be sufficient to counterbalance the pain it will probably inflict on the patient. It is possible, however, that, notwithstanding the disagreeable effect it produces on the head, it may yet become a useful remedy. In the short time which has elapsed between the appearance of the last two editions little change has been necessary in the body of the work, but the additions we have noticed increase its value very considerably.

The Laws of Therapeutics. By JOSEPH KIDD, M.D. 8vo. pp. 232. London: Kegan Paul and Co.

THE author begins with a short history of the various medical doctrines which have governed medical practice at various periods of the world's history, and remarks very truly that the substitution of the doctor's opinion for the exact observation of facts has been the cause of the barren state of therapeutics from the time of Galen until now. He laments that some teachers of therapeutics of the present day give details, but are afraid to teach the laws of therapeutics. In this, we think, they are right, for we have not yet arrived at general laws, and to teach them would at present simply be to promulgate "doctors' opinions" and throw obstacles in the way of the observation of facts. One of the most dangerous sources of error, and one which is to be avoided with the utmost care by every seeker for truth, is the temptation to draw general conclusions from limited premises. It is so easy to generalise that it is very difficult indeed to prevent oneself from doing so occasionally, but it is a tendency which must be carefully kept in check. Dr. Kidd acknowledges two laws, that of *contraria contrariis* and *similia similibus*, but the cases he gives in his chapter on *Ars medica*, show that, like a sensible practitioner, he does not allow himself blindly to follow either the one or the other, but seeks out the cause of the disease and tries by rational measures to remove it. The cases are the most valuable part of the book. We think that it would have been much better not to mention by name certain physicians whose plans of treatment were ineffectual, but the cases are both interesting and suggestive, and are well worth perusal as affording valuable hints in regard to treatment.

The Antidotal Treatment of Disease. By JOHN PARKIN, M.D. Part I. 8vo. pp. 307. London: Hardwick and Bogue.

THIS work affords an excellent illustration of the tendency to generalise already alluded to. The author deals in this part of his work with fevers. He considers them to be caused by poisons, and thinks the proper treatment consists in the administration of an antidote. Such an antidote he believes carbonic acid to be, and he gives several cases of recovery under the treatment. One is rather astonished to find that while this success is attributed to the carbonic acid, this remedy was not given alone by inhalation or in water charged with it, but that the actual treatment consisted in the administration of thirty grains of bicarbonate of soda and twenty of tartaric acid in a state of effervescence every quarter of an hour. It is quite possible that this treatment may practically be very useful in ague, and may succeed even when quinine fails; but it is certainly generalising too much to conclude that the success was due to the carbonic acid generated by the combination of the two substances administered, and to found on this a new pathological and therapeutical system—the antidotal treatment of disease.

Materia Medica of the Hindoos. By UDOY CHAND DUTT. 8vo. pp. 353. Calcutta: Thacker, Spink & Co.

THIS is a compilation from standard Sanscrit medical works, and gives an account of the chief remedies employed in Hindoo medicine, their mode of preparation, and the uses for which they are employed. The author has wisely omitted the Hindoo notions regarding their supposed effects on the system and humours. He has also reserved for a future essay the results of modern researches on Hindoo drugs and his personal experience of their use, his object having been to show the extent of knowledge attained by Hindoo physicians by their own practice and observations. The work seems to have been done with great care, and is accompanied by a glossary of Indian plants by Mr. King, Superintendent of the Royal Botanical Garden, Calcutta. Although it is possible that some of those drugs have been employed by the Hindoos from theoretical reasons, and without their possessing any real power, yet it is probable that a number of them really possess useful properties, and may prove very serviceable remedies.

The Therapeutic Forces. By THOMAS J. MAYS, M.D. 8vo. pp. 143. Philadelphia: Lindsay and Blakiston.

THIS is an attempt to consider the action of medicines in the light of the modern doctrine of the conservation of force. The effort is ingenious, but we do not think it quite successful; nor do we believe that any work on the subject can be successful at the present time, the data we possess being insufficient. In talking of the action of quinine the author says that "quinia in small doses is analogous in its action to a mild force of wind blowing across a field of tall grass." "It moves in a direction contrary to that of, and comes in contact with, the weaker molecular forces of the body, and motion necessarily takes place in the line of least resistance, which is in consonance with that of the attacking force, until at such a point where a momentary equilibrium is restored by the action of the bodily force, after which motion takes place in an opposite direction. By the prolonged action of quinia a series of oscillations or waves is produced, and in this way the bodily molecules are impelled to their former degree of energy and activity; they thus acquire an additional amount of strength, which will remain even after the attacking force has subsided. In this way it serves as a stimulant to the weak digestive powers, and owing to its great diffusibility, it is equally efficacious in imparting vigour and strength to every texture and function of the body." Such speculations as these on the action of medicines are interesting, especially to certain minds. They may contain much truth, but at present it is impossible to verify them. Those who are fond of such theoretical questions, however, will find in this book, which is written in an easy style, matter both for consideration and discussion.

Clinic of the Month.

Treatment of Catarrh of the Stomach.—Dr. Kuster has had a great deal of experience in the treatment of the above-mentioned disease. He does not approve of the use of the stomach-pump, it being rather an awkward and unwieldy instrument to handle, both for physicians and for private patients, who generally object to it. Among the large number of drugs which have been used in gastric catarrh, he decidedly prefers only three, viz. hydrochloric acid, Carlsbad salt, and nitrate of silver. He administers them in the following doses. Of hydrochloric acid he gives from five to eight drops, to be taken in a wine-glass before and after meals. The dose of Carlsbad salt is one or two teaspoonfuls dissolved in hot water daily. Nitrate of silver is given in the form of pills, containing each five milligrammes (·075 grain) of nitrate of silver, and seven milligrammes (·105 grain) of extract of belladonna. Each of these drugs seems to fulfil special indications, and to counteract in some way the effects of the other. According to the author's theory, they should be used as follows. Hydrochloric acid is only useful in cases where the catarrh of the stomach or the disagreeable sensations experienced shortly after food are caused by a scanty supply of the gastric juice, especially gastric acid. It will also prove very useful when the patient complains of loss of appetite, pains and pressure on the stomach after food, especially after meat, and of profuse diarrhœa, but does not suffer from flatulence or acid eructation. These symptoms are caused by the want of acid in the gastric juice, and will therefore be removed as soon as an acid is introduced. Persons who smoke generally suffer from want of gastric acid, the secretion of which is probably rather lessened by the nicotin which is swallowed in smoking. Carlsbad salt must be used in cases which are diametrically opposed to the above-mentioned. It is most efficacious in neutralising the surplus amount of acid when there exists an over-secretion of it, and in cleansing the stomach from large quantities of mucus, which generally accumulates in it. It acts in a certain way very much like a stomach-pump, minus the disagreeable sensation of having a tube put down one's throat. As for nitrate of silver it has not yet been proved in what cases it is most efficient. It has been used a great deal in ulcers of the stomach; but the author is of opinion that this is rather a dangerous practice. He has given it without any special indication in cases where there were no symptoms of ulcers, and has always found it extremely useful. He has also used it with some success in the treatment of females having a tendency to chlorosis and nervous irritability. (*Allgemein. Medicin. Central-Zeitung,* No. 98; *British Med. Journ.*, January 18, 1879.)

Treatment of Perforation of the Cæcum and Appendix Vermiformis.—Dr. Noyes treats the functional disturbance with laxatives. Drastic cathartics he states should not be employed. Copious warm oleaginous and solvent enemata are used with much advantage. Hot fomentations and turpentine stupes are highly useful. Typhlitis and perityphlitis are best treated with laxatives, opium, leeches to remove the congestion, enemata, and hot fomentations. Turpentine stupes are important, and such other antiphlogistic treatment as may suggest itself to the practitioner. Iliac abscess is best treated after the manner inaugurated by Dr. Hancock in 1868, and revived by Dr. Parker. An incision just above and parallel to Poupart's ligament, extending through the abdominal parietes to the transversalis fascia, relieves at all events the tension, and renders the external pointing of the abscess the more probable. A hypodermic syringe determines the diagnosis. Just here the skill of the surgeon is brought into requisition. If he has reason to believe that adhesions have formed, he will succeed best by extending his incision and allowing the pus to escape. Dr. Parker recommends that the incision should not be made before the fifth day nor after the twelfth. (*Boston Surg. and Med. Journ.*, Nov. 7, 1878.)

Capsicum in Extreme cases of Delirium Tremens.—Mr. Crowther calls attention to the fact that capsicum is a valuable remedy in dangerous cases of delirium tremens. He also shows that the same drug is useful in the treatment of pneumonia. In both affections the value of capsicum is due to its stimulating and derivative effects. Mr. Crowther has as yet only made two trials in cases of delirium tremens, the second case being complicated with pneumonia. He finds that capsicum acts rapidly, reducing—in a few hours—all tremor and agitation, whilst the patient afterwards falls into a calm and prolonged sleep. The skin, originally clammy, is soon restored to its natural warmth, and perspires freely. The pulse falls rapidly from 140–150 to 100, and instead of being small and compressible, regains its fulness and volume. Both the kidneys and bowels act freely, large quantities of urine being passed frequently, and the alvine evacuations in large quantities (the bowels being continually relaxed whilst taking the capsicum). Mr. Crowther believes that the brain becomes tranquil, owing to the derivative action of the drug. The capsicum is best administered in the form of tincture, half a drachm in half an ounce of water every three hours. (*Lancet*, January 25, 1879.)

The Treatment of Chorea.—Mr. Hayden, commenting upon cases of chorea which he has lately been called upon to treat, states that the attack is in most cases traceable to fright, or other emotional excitement of a depressing character operating upon a nervous and feeble constitution, at a period of life when the receptive faculties are most sensitive. He believes that the attack commences with vaso-motor paresis, resulting from a profound emotional impression, and that the essential symptoms are due to defective polarity or dynamic instability of the motor nerve tracts, both intra-cranial and spinal. On this hypothesis the vascular congestion, central and peripheral, of the brain and cord, with occasional extravasation, and in inveterate cases central sclerosis, noted by Dickenson, might be explained. Reasoning from the foregoing premises, he concludes that phosphorus and strychnia combined—the former a nerve-nutrient of recognised value, and the latter a nerve-tonic of great potency—might prove efficacious in the treatment of chorea. As yet his experience of this plan of treatment has been very limited, extending only to three cases, but so far it has been eminently satisfactory, and he ventures strongly to recommend a further trial. The drugs were administered in doses of 3-5 ♏ arsenical solution, with syrup of phosphate of iron ʒi, three times daily. (*Dublin Journ. Med. Sci.*, Jan. 1, 1879.)

Sodium Sulphomethylate as a Purgative. — M. Rabuteau has recently made some researches in regard to the physiological action of a new saline purgative, sodium sulphomethylate, or methyl-sulphate. This is a colourless salt, crystallising with difficulty, but destitute of any disagreeable flavour. M. Rabuteau first injected ten grammes, or about two and a half drachms of the salt, dissolved in ten times its weight of water, into the veins of a dog, and found that no diarrhœa was produced. Subsequently he administered fifteen grammes, about half an ounce, of this salt, dissolved in two wine-glassfuls of water, to a patient under the charge of M. Quinquaud, in the Hôtel Dieu. The effect was that it caused free evacuation of the bowels. In remarking upon its effects M. Rabuteau states what he believes he has demonstrated in regard to all saline purgatives, that in small doses they produce constipation, whilst in large doses they are purgative. (*La Progrès Medical, Janvier* 25, 1879.)

Corns and their Treatment.—In *L'Année Médicale* for June, 1878, M. Guibout thus explains the pathology and treatment of this too familiar infirmity:—These execrable corns, he says, consist of an induration and hypertrophy of the epidermis, which grows downwards, taking the form of a nail, with the point directed against the deeper parts. The portion of skin in contact with the induration becomes inflamed and altered; its papillæ disappear, and at last it becomes a veritable matrix, producing from below new layers of horny epidermis as the upper layers are removed. His treatment is to soften the corn by applying to it, for one night, an ointment consisting of turpentine and acetate of copper, each one part; white resin two parts, and yellow wax four parts. The corn should then be excised with scissors, care being taken to go deep enough to remove its summit. After excision the matrix should be cauterised with sulphuric acid, else the corn will be reproduced. (*Glasgow Medical Journal, Feb.* 1879.)

On the Treatment of Diseases of the Colon.—Dr. Dubois enumerates the diseases of the colon in which the injection of large or small quantities of water is indicated. He then adds some practical hints on the different ways of administering the fluid. There are two different kinds of enemata employed. First the simple enemata, which are used in cases of constipation, when it is found necessary to remove fæcal masses from the sigmoid flexure, the cæcum, or the rectum, in cases where the mucous membrane of the rectum is diseased, and it is indicated to bring it into contact with water or medicine; secondly, very large enemata, which will be found efficient in cases where the water ought to be injected high up into the large intestines, or whenever there exists a catarrhalic affection of these portions of the intestines. Some patients can bear, without incurring pain or danger, enemata of 1,000 to 1,500 cubic centimetres of water, but in others such a large volume of fluid would either prove very dangerous to the intestines, or could not be injected on account of the great irritation of the intestinal muscles. In such cases, where it is of obvious necessity to inject a large bulk of liquid, the author advises the following method. Tepid water is injected till the patient feels a violent strain. The syringe is then removed, and the patient slowly changes under the bed-clothes from his right or left side to crouching on his knees and elbows. After one to two minutes the former position is again assumed for a short time, and then the patient lies down upon his back. The same operation and changes of posture are then repeated, and defæcation generally ensues in about ten minutes or half an hour after the injection has been given. This method is indicated: *a*, in cases of constipation where purgatives and the usual enemata can either not be given or have proved powerless; *b*, in cases of coprostasis where fæcal tumours, varying in size, can be felt in the cæcum or other parts of the large intestine, and have sometimes been mistaken for ovarian cysts. Here purgatives given by the mouth are either vomited or have no effect; *c*, it is well known that inflammations of the vermiform process are mostly caused in healthy individuals by accumulation of fæces. Whenever, therefore, a slight tenderness and increased resistance are felt in the iliac region, especially in persons who have suffered from typhlitis before, a bulky injection will be found very useful in preventing the inflammation and removing the fæces. Narcotics should also be used in these cases; *d*, in cases of general or local peritonitis, when constipation and accumulation of gases in the abdomen have been produced by paralysis of the intestinal muscles; *e*, in cases of diarrhœa caused by constipation or accumulation of fæces; *f*, in abscesses of the intestines, dysentery, &c. (*Schweitzer Correspondenzblatt Memorabilien*, 1878, ix. Heft, and *London Medical Record*, Jan. 15, 1879.)

On the Rise and Fall of Temperature, and Frequency of the Pulse caused by Tepid Baths.—Dr. von Liebig finds that during a tepid bath of 89°, which lasts for thirty minutes, the frequency of the pulse is very little lessened, but goes on decreasing during half an hour to one hour after the bath, which time corresponds to the chill that is always experienced after bathing. The temperature taken in the mouth rose a little during the bath, and sank after it, being lower two hours after the bath than it had been before it. The curves of the pulse, which were taken about an hour and a half after the bath, showed a slight deviation from the normal curve, the highest point of the ascendant stroke being flattened, and the re-ascent of the down-stroke entirely deficient. This is explained by the arterioles being contracted by the cooling of the skin, and thereby increasing the resistance in the arteries. The diminished frequency in the pulse may be traced to the same origin. The elevation of temperature during the bath is caused by the decrease in the loss of heat. The increased expiration of carbonic acid is explained by the fact that as during the bath the lungs are not subject to the pressure of the water, the blood circulates more quickly in them. The skin is stimulated in different ways during a bath. These are temperature of the water, pressure of the water, suppression of the exhalations of the skin, and in salt water the osmotic influence. On leaving the bath these effects of stimulation are of course changed. (*Aerztl. In-*

telligenzblatt, 1878, Nos. 23 and 24; *London Med. Record,* January 15, 1879.)

Nitro-Glycerin as a Remedy for Angina Pectoris. Mr. Murrell has again taken up the subject of nitro-glycerin as a therapeutic agent. The substance was originally noticed by Mr. Field of Brighton, but the results which he obtained from its use were challenged by Dr. Harley and Dr. Fuller, and it has been allowed to fall into abeyance. From a consideration of the physiological action of the drug, and more especially from the similarity existing between its general action and that of nitrate of amyl, Mr. Murrell was led to conclude that it would probably prove of service in the treatment of angina pectoris. This anticipation has been realised. After experimenting upon himself with this drug, he has administered it in several cases of angina pectoris. The patients were first placed upon a short course of camphor water, after which a drop of the one-per-cent. solution of nitro-glycerin in half an ounce of water was ordered to be taken every four hours. In two or three days the patients state that they are better, the pains occurring less frequently, and not lasting so long. The dose was ultimately increased in one case to as much as 20 ♏ every four hours. In the case of this latter dose the patient—a woman—was powerfully affected by the drug for nearly three-quarters of an hour, experiencing noises in the ears, a sensation of cold, and fits of gaping. When these effects had passed off, however, the patient felt quite well again. The symptoms following the administration of a two-drop dose were slight flushing of the face, a decrease in the fulness of the arteries, a rise in the pulse-rate, subsequent intense pallor, and a feeling of faintness lasting for a quarter of an hour. In course of time, however, the dose of nitro-glycerin ceases to be followed by these disagreeable after-effects, even when administered in considerable quantities. (*Lancet,* Feb. 1879.)

Bromine in Laryngeal Croup.—Dr. W. Redenbacher writes in the *Aerztliches Intelligenzblatt* of January 7, that he has obtained strikingly good effects in two cases of laryngeal croup from the internal administration of bromine (in the form of bromide of potassium). For some time bromine inhalations have been used in the following manner. From 0·2 to 0·3 gramme of bromine with a similar or greater quantity of bromide of potassium, has been dissolved in 120 grammes of water, and a sponge or handkerchief dipped in it being tied before the nose and mouth, the bromine vapour has been inhaled for five or ten minutes, at intervals varying from half an hour to an hour. From this method, however, Dr. Redenbacher has not been able to obtain any good result. Two little girls, aged respectively five and seven, having come under his care with severe croup of the larynx and air-tubes, he ordered a tablespoonful of the following mixture to be taken every hour: ℞ decocti altheæ 120 grammes; potassii-bromidi, 4 grammes; bromi, 0·3 gramme; syrupi simplicis, 30 grammes. On again visiting the patients, whom he did not expect to find alive, he was most agreeably surprised. The harsh respiratory murmur, the difficult breathing, the dry characteristic cough, the loss of tone in the voice, had all disappeared; the breathing was free, the cough loose, and the hoarseness diminished. Several portions of croupal membrane had been coughed up. The improvement continued on the next day, and perfect recovery followed in a few days. No toxic symptoms of any kind were produced. For children under one year the quantity of bromine in the mixture should be reduced to 0·1 gramme, and for those from one to four years old to 0·2 gramme. (*British Med. Journal*, February 15, 1879.)

Extracts from British and Foreign Journals.

Treatment of Dysentery.—Mr. Deb recommends the fresh root of the plant Ixora Dandxuca, which is fairly common in India, as a most excellent remedy in cases of dysentery. The whole root should be used, not the bark only, and it is found that the fresh root is more effectual than the dry one, the slender part possessing most virtue. The method of preparation, to form a tincture, consists in coarsely powdering the fresh root; four ounces of the powder are then macerated in a pint of proof spirit for a week in a closed vessel which is occasionally agitated. The fluid is afterwards pressed out and filtered. Six drachms of long pepper coarsely powdered may be added to the liquid thus prepared to make a compound tincture. The dose is one to two drachms. The drug is very efficacious in dysentery, most so, as is the case with ipecacuanha, when the cases treated by it are seen early. It possesses the advantage of not creating nausea, whilst it has an aromatic and agreeable taste. It has been given also in 15-30 grain doses three or four times a day, and may be administered with confidence to patients of all ages. (*Indian Med. Gaz.*, Oct. 1878.)

The Smell of Hair.—M. Galippe has made some original observations which are of use in medico-legal cases in regard to the odour emitted by hair. From the simple smell of a lock of hair, he states that he is able to recognise whether the lock has been cut from the living subject, or whether it is composed of hair which has fallen out. Hairdressers have acquired this art, which is said never to fail them. Hair which has fallen out has a dull appearance attributable to disease, and is not easily made up; it has no peculiar smell. The hair of the Chinese has a characteristic odour of musk, which is so persistent that it cannot be concealed by cosmetics, for it is not destroyed by washing in potash. The hair of the Chinese has also a reddish tinge, and is polyhedral in section. The hair of hysterical patients has a peculiar and distinguishing odour which is most perceptible at the approach of a crisis. Certain hair is electrical, the electricity being developed more readily after rubbing. In a subsequent discussion upon this paper, which was read before the Societé de

Biologie, M. Bert stated that hair when it turned white from age, began to change colour rather at the apex than at the base. (*Le Progrès Medical*, February 1, 1879.)

The Action of Arsenic as a Poison.—Professors Binz and Schulz have investigated the results of poisoning by arsenic, in relation to its therapeutic results. If a solution of arsenious acid of its neutral salt is injected beneath the skin of an animal, no trace of local caustic action results; but unless the animal quickly dies by paralysis of the heart, the stomach and whole intestinal tract are for a few hours intensely inflamed. A saturated solution (in the cold) of vitreous arsenious acid, or of sodic arsenite, or arseniate, placed in the conjunctival sac of a guinea-pig, produces only slight local redness—hardly more than an equally strong solution of ordinary salt. Arsenic has no immediate affinity for albumin, and is, as Buchheim remarks, probably first transformed into a poisonous compound in the organism; but of the precise nature of this poisonous compound we are at present ignorant. In experimental chemistry both the compounds of arsenic are available as oxygen-carriers. After reduction they are easily oxidised, and may again be used as oxidising agents. Both these processes may take place when the arsenious compounds are in contact with organic substances. If arsenic acid, or its weak alkaline salt, is digested with fresh albumin, fibrin, pancreas, &c., and even with vegetable protoplasm, dialysis always yields arsenious acid, and no decomposition occurs. Decomposing fibrin gives the same reaction. On the other hand, if arsenious acid, free, or as its salt, is digested with pancreas or with the fresh leaves of Lactuca Sativa, dialysis yields definite evidence of arsenic acid. Defibrinated arterial blood, as well as pure oxyhæmoglobin, on the other hand, leave the arsenious acid unchanged.

In six cases of slow subcutaneous poisoning, it was observed that the gastritis was most marked in the neighbourhood of the pancreas, and that it constantly proceeded from the posterior wall. This is corroborated by some observations in cases of poisoning in men, when the place where the gastric irritation commenced could be traced. This localisation has nothing to do with the local accumulation of the arsenic taken by the mouth, because in the experiments on animals in which the arsenic was introduced directly into the blood the same change was observed. Further investigation led Binz and Schulz to the following theory. The arsenious acid, which has an action on albumin, is certainly in part oxidised to arsenic acid, and this is again reduced. Protoplasm effects the oxidation, and in it also the reduction occurs most strongly. This unusual interchange of nascent oxygen within the molecules must tend to the

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formation of nitrous acid, and in part also to nitrous oxide, the latter being further transformed to nitric acid, and thus the protoplasm will be destroyed more quickly than the interchange of matter can renew it. The arsenic thus plays the part of an oxygen-bearer, and leads to a sort of molecular combustion. The interchange of the oxygen probably takes place most readily in the glandular organs of the intestinal tract, but may occur elsewhere, and probably does occur, especially in the nerve-centres, in which so energetic an interchange of material is always going on. Hence the irritation and quick paralysis of the nerve-centres. We are also able to understand on this theory of its action why there is so rapid a diminution of glycogen in the liver when arsenic is given in food; why the organ undergoes fatty degeneration; and also the effect on malaria, and the subsidence of lymphomata under its use. (*Centralblatt f. die Med. Wiss.—Lancet*, February 8, 1879.)

The Intravenous Injection of Milk.—Dr. Robert Macdonnell performed this operation in Dublin upon a patient suffering from extreme exhaustion consequent on typhoid fever. The patient, a man about thirty years of age, took fever in November last. This was followed by great debility, emaciation, and exhaustion. Dr. Austin Meldon, under whose immediate care the patient was, tried all possible means to get up the strength. Several of the leading Dublin physicians saw the case in consultation with him, among others Dr. Lyons, who as a last resource suggested transfusion. Dr. Meldon asked Dr. MacDonnell to see the patient, with a view to his performing this operation with his transfusion apparatus. Dr. MacDonnell suggested that the case was one suitable for trying milk instead of blood, as had been done by Dr. Pepper, Dr. Gaillard Thomas, and others in America. On Wednesday, January 22nd, the operation was performed in the presence of Dr. William Smyly, Dr. Martin, and Dr. Meldon. The milk was fresh drawn from a cow on the spot. About ten ounces were passed into a vein at the bend of the elbow. During the injection the pulse rose, and became fuller and stronger. Immediately after the completion of the operation the pulse became feeble, respiration laboured, and the capillaries congested. This state of depression lasted about two hours, when a distinct and truly remarkable reaction took place. The patient passed a quiet night, and expressed himself as much better and stronger on the following day. On the seventh day after the operation the patient was making good progress, although of course weak and exhausted. The diarrhœa had ceased, and his ability to digest suitable nourishment had greatly improved. On the sixteenth day after the operation as the patient appeared to be again sinking, the operation was repeated, similar symptoms to those observed on that occasion again manifested themselves, but to a less alarming extent. He appeared to be doing well, but in three hours after the operation convulsions of a tetanic character set in, and the patient died. Four ounces of milk were injected. The operation was again performed by Mr. Meldon on the 7th ult. The subject was a man in the last stage of phthisis, with profuse diarrhœa and apparently not an hour to live. Two ounces of milk were injected. The effects of the operation were very beneficial. He has wonderfully improved in health since, and, as noticed in other cases, the diarrhœa from which he suffered has ceased. (*The Lancet* and *British Med. Journal*, Feb. 1879.)

Influence of Injected Proteids on the Body.—Béchamp and Balthus, after injection of eighteen grams of albumin—white of egg—into the veins of dogs, discovered, in one experiment, ten grains, and in a second 10·255 grams of albumin in the urine. The specific power of solution for polarised light was 41·42° for the injected albumin, 41·5 and 39·5° for the albumin eliminated. No account of the method of experiment is given, although the expression, after the injection of eighteen grams of albumin, ten grams reappeared in the urine, is not intelligible. A kidney ferment—diastatic—for albumin, appeared in one case. In four cases ninety grams of serum from an ox were injected; the kidney contained no albumin. The second series of investigations were made with isolated albumins which gave no ash: (1) Albuminous bodies obtained from the albumen of hens' eggs appeared again partly in the urine, their rotatory power was lessened. (2) The albumins from the serum did not appear in the urine. (3) After injection of eight grams of ash free gelatin dissolved in 100 cc. of water at 39° C., no gelatin was found in the urine. The injection caused the appearance of symptoms in the alimentary tract and kidneys. (4) Nine grams of gelatin, soluble in cold water, caused death before they could be eliminated by the urine. (*Centrabl. f. Med. Wiss.*, 1878, p. 845.)

Subnitrate of Bismuth.—Professor Gubler, speaking of this substance at the Académie, observed that it is a mechanical absorbent just like any other dry powder; and it is a certain antacid, for while it does not absorb carbonic-acid gas, which is secondary, it efficiently absorbs the normal acids in excess in the gastric juice, and especially the acids formed accidentally at the expense of alimentary or other matters introduced into the *primæ viæ*—acetic, and lactic, and volatile acids. Moreover, the basic salt of bismuth possesses the very great advantage of absorbing sulphuretted hydrogen gas, or of producing with the sulpho-hydrate of ammonia, by double decomposition, nitrate of ammonia and sulphurate of bismuth. In this latter effect bismuth can only be replaced with difficulty—chalk, in particular, the employment of which would be so convenient, so cheap, and so inoffensive, not seizing hold of sulphuretted hydrogen. Oxide of zinc is the only other substance that can fulfil all the indications so well met by bismuth, and it easily becomes nauseating or emetic. It is, however, a remarkable fact that this inconvenience especially occurs when small doses of the oxide are employed—as from a twentieth to a fifth of a gram—which always meet with enough acid in the stomach to convert them into neutral salts. When large doses are given—as a half to one, two, three, and four grams per diem—they are exempt from all emetic properties, and especially when united with sufficient bicarbonate of soda to neutralize the acids of the *primæ viæ*. This combination furnishes excellent results in the same cases in which bismuth succeeds. (*Medical and Surgical Reporter*, October 19, 1878, and *Edinburgh Medical Journal*, January, 1879.)

Oxalate of Cerium and Caffein as Preventives of the Nauseating Effects of Opium.—To Prof. De Costa is due the credit of having first suggested the combination of bromide of potassium with morphia to obviate the disagreeable after-effects which so frequently distress patients to whom morphia has been administered. It frequently happens that the potassium salt cannot, in consequence of its bulk and unpleasant taste, be employed. Especially is it objectionable when the practitioner prefers to use opium either in the form of a pill or powder; nor is its therapeutic effect always desirable. To meet these objections Dr. Busey has for some time past combined the oxalate of cerium with opium, and has, in a great many instances, found it equally efficacious in obviating the nausea and mitigating the distressing after-effects. Sir James Simpson introduced the oxalate into use as a now valuable agent in relieving the nausea and vomiting of pregnancy. Since then its employment has been very widely extended, and it has become quite common to combine it with drugs and to secure their tolerance by the stomach. For a long time Dr. Busey was accustomed to prescribe a strong decoction of coffee, without milk or sugar, in drachm doses, administered every fifteen minutes, to relieve the nausea and headache following the employment of opium. Since the introduction of the effervescing citrate of caffein, he has found it a very agreeable and efficient substitute for less palatable beverages. These agents are, however, only applicable after the occurrence of the stomachic disturbances. The citrate of caffein, though less efficient than the oxalate of cerium, may be combined with opium. It is inadmissible in those cases where opium produces wakefulness instead of drowsiness. It has sometimes been fancied to lessen the soporific, without affecting the analgesic, properties of opium. (*American Practitioner*, September, 1878; *Edinburgh Medical Journal*, December, 1878.)

On a Neglected Proximate Cause of Dyspepsia.—In a paper on this subject read before the Medical Society, Dr. Leared argued that, in a large proportion of dyspeptic cases, the fault does not lie with the gastric juice *per se*, but with the muscular structures of the stomach. Owing to nervous debility, the peristaltic movements of the organ are more or less diminished, or even arrested. The result is that the food, not being duly submitted to the action of its solvent, in part ferments, and the gas evolved distends the stomach. This distension tends to impair the tonicity of the muscular fibres still more, so that, in some cases, the stomach may be said to be paralysed. The remarkable way in which stirring aids the solution of soluble substances in water was adduced by the author in proof of his position. Although the revolution of the morsels of food was graphically described by Dr. Beaumont from actual inspection, he failed to grasp their importance in relation to pathology. Instead of the old division of atonic dyspepsia and dyspepsia dependent upon gastritis, Dr. Leared proposed to divide dyspepsia into that from impaired motion and that from defect of secretion; and he maintained that by further subdivision all varieties of true functional dyspepsia might be ranged under these two heads. The difference in origin of the proximate causes was also pointed out, and the treatment of impaired peristalsis was explained at some length. Diet was held to be of great importance; and amongst remedies, strychnia was foremost. This drug, properly handled, the author affirmed to be almost a specific for relaxation of the gastric muscular fibres. (*British Medical Journal*, December 28, 1878.)

Retention of Iodine in Acne Pustules.—Adamkiewicz has demonstrated in a case of very severe acne after iodine the presence of iodine in the pus of the acne pustules by adding drop by drop to the contents of the pustules, well mixed with starch paste, an acid diluted with a considerable quantity of distilled water. Fuming nitric acid is recommended for obtaining this reaction, which can only be got by using the greatest care to prevent oxidation of the blue colour formed by the action of iodine on starch paste from the presence of an excess of nitrous oxide. The iodine is present only in very small traces in the contents of the pustules, such contents being also obtained with difficulty and in small quantity. The acne pustules are inflamed sebaceous glands, Adamkiewicz therefore supposes that these organs eliminate iodine, and act as true excretory organs. (*Charite Annal. Berlin*, iii. 1878, p. 381.)

Treatment of Croup by Hypodermic Injection of Perchloride of Iron.—Dr. Palvadeau has treated simple angina of the throat with a solution of perchloride of iron, fifteen or twenty drops in a glassful of water, a tablespoonful being taken every ten minutes, held for a short time in the mouth. Finding this method of treatment successful Dr. Palvadeau sought to render it applicable to cases of croup, in which the application of the remedy by the mouth is impossible, since the diphtheritic growths are situated in the trachea and larynx. A mixture of equal parts of perchloride of iron and water to the extent of five or six drops are injected hypodermically into the trachea below the thyroid cartilage to the depth of 1·5 centimetres. In this way the iron is brought into direct contact with the diseased surface. In another case in which this method of treatment was adopted, three injections were required, in two of which fifteen drops were injected on each occasion. (*La Tribune Médicale*, July 7, 1878.)

The Treatment of Phagedæmic Ulcers.—Dr. Weisfolg recommends the use of the faradaic bath in the treatment of this, the most difficult of the therapeutic problems presented by the various manifestations of syphilis. The application is made by immersing the sore in a basin of warm water, to the bottom of which an electrode is connected. The battery being arranged so as to give a very weak current, the patient applies one finger to the sponge of the electrode; two or more fingers may be placed upon the sponge if the patient does not find the application too strong to be borne with comfort. Faradisation of the nerves leading to the wound may be conducted in a similar manner: the parts in the vicinity of the sore being stroked with the sponge of one electrode whilst one or more fingers are placed upon the other. In the intervals dressings of oiled lint may be applied. The pain at first soon recurs after each faradisation, and for a few days the patient will frequently have recourse to the use of the battery; but the period of relief gradually becomes longer after each application, and at the end of eight or ten days the sore is not more painful than an ordinary non-specific ulcer. In the meantime the appearance of the ulcer has not undergone any corresponding improvement, its base still being covered with adherent sloughs, its margins raised and occupied by a brawny infiltration, although the excessive sensibility has entirely disappeared. At this stage there are many remedies which will act beneficially, but of these the nitrate of mercury deserves the preference. It may be used in the form of an ointment, eight grains to the ounce. A phagedæmic ulcer is more difficult to treat when the patient is at the same time suffering from periosteal pains, for in these cases the relief afforded by the faradaic current is not so complete. Under these circumstances injections of the nitrate of mercury are extremely serviceable. They are less harmful than injections of mercury perchloride, do not cause abscesses, and supply the system with a much larger quantity of soluble mercury, without causing salivation, than can be done in any other way. For the relief of periosteal pains the subcutaneous injections of nitrate of mercury do not require to be made more often than once in fourteen days. They will usually effect a cure in about two months. The formula for injection is as follows :—

℞ Hydrarg. oxid. nit. crystall. gr. viii.
Aq. distill. fl. ʒxiv.
Dispens. solutio limpida.

(*Virchow Arch.*, vol. lxvi. p. 3111, and *Canada Med. and Surg. Journ.*, Sept. 1878.)

Treatment of Intertrigo in Infants.—Intertrigo always begins as an erythema, a simple hyperæmia of the skin, caused by some chemical or mechanical irritant, such as an abnormal character of the fæces, decomposed urine, &c., or by the continued contact and rubbing of two cutaneous surfaces opposed to each other. This condition passes into erythematous dermatitis, and when the infant is in a cachetic state, it comes to the formation of a diphtheritic membrane on the excoriated places, or to the transformation into gangrenous ulcers. This disease is not confined to children of the poorer classes, for the skin of some children possesses an abnormal vulnerability, so that the slightest irritation can produce an erythema, which, once existing, spreads with amazing rapidity. The treatment has for its duty to remove the exciting cause and to heal as quickly as possible the cutaneous eruption. When the intertrigo is situated in the neighbourhood of the anus, attention is to be directed primarily to the character of the stools. If they are thin and of acid smell, the following powder is to be used two or three times daily: Calcis precipitat. gr. iss. Bismuth subnitrat. gr. i. Sacchari alb. gr. iij. M. In other cases where the discharges have a less serous character, and are characterised rather by abundant yellowish-white flakes of casein, minute doses of hydrochloric acid produce better results. Great care is to be taken to remove wet diapers, and to insure constantly dry underclothing, whilst the folds of skin should be washed with lukewarm soap and water. Powders should be used locally only when the epidermis is sound, an admixture of semen lycopodii with finely powdered sub-nitrate of bismuth, or oxide of zinc, being found most useful.

Whenever the intertrigo is so advanced as to produce moist excoriations, the unguentum diachyli of Hebra is most satisfactory in fresh cases. In other cases it fails, and corrosive sublimate is to be employed in severe forms of the disease. This remedy is applied in solution ℞ Hydrarg. chlor. corros. 0·05. Aquæ distillat. 100 M. (About one grain to four ounces of water.) Pieces of lint are soaked in this solution, and laid upon the diseased surface. It often suffices to apply the solution in this manner three or four times a day for an hour at a time, and it is only rarely that the application need be continuous. The disease is frequently cured in this manner in from 24-36 hours. No injurious effects from the absorption of mercury have been observed. Whilst the recovery is progressing the unguentum diachyli should be employed for a short time to prevent relapses. All doubts as to the existence of congenital syphilis must be excluded. When the intertrigo becomes diphtheritic or gangrenous, an antiseptic treatment must naturally be resorted to. (*The Boston Med. and Surg. Journ.*, July 25, 1878.)

The Changes in the Small Blood-vessels in Bright's Disease.—Dr. A. Ewald has lately published in Virchow's *Archiv*, Band lxxi., the result of a long investigation on the above subject. Like Dr. George Johnson, and Drs. Gull and Sutton, he microscopically examined the vessels of the pia mater covering the pons in a considerable number of cases of various forms of nephritis; but he was unable to discover those alterations of the arterial coats which the latter authors have described as "arterio-capillary fibrosis," whereas he was able to confirm Johnson's statement that the muscular coat of the arterioles is hypertrophied in the great majority of the cases of contracted kidney associated with cardiac hypertrophy. Ewald regards the "hyaline-fibroid" arterial degeneration of Gull and Sutton as mainly the result of their method of microscopical preparation. He found that the normal relation of the lumen of the arterioles to the section of their coat is as 1 : 0·1—1·3, and he assumed that there was hypertrophy present when this relation rose to 1 : 0·5—1·2. The alteration in the muscular coat which gives rise to the hypertrophy consists, according to Ewald, in a simple enlargement of the normal cells and of their intercellular substance. Ewald has tabulated sixty-two cases of renal disease in which the condition of the heart, the vessels, and the kidneys was carefully noted at the post-mortem examination. The general conclusion arrived at is, that hypertrophy of the heart and the arterioles is most frequently met with in the advanced forms of granular contracted kidney, though the relationship between the two conditions is an intimate one in all the stages of interstitial nephritis. In those cases where interstitial and parenchymatous (epithelial) degeneration occur in combination, though the former change predominates, two-thirds of the cases present cardiac and arterial hypertrophy, and one-third cardiac hypertrophy only. On the other hand, where the parenchymatous degeneration prevails over the interstitial, all the cases are accompanied with hypertrophy of the heart, and none with that of the arterioles. The cases of pure parenchymatous degeneration, sixteen in number, which Ewald examined, were all free from vascular change, and somewhat less than a third of them were associated with simple hypertrophy of the heart. Nephritis, secondary to such diseases as phthisis, leukæmia, and heart disease, was, as a rule, unassociated with hypertrophy of the muscular coats of the arterioles. Ewald agrees with those English authors who assert that both ventricles of the heart are not unfrequently hypertrophied in interstitial nephritis, the right ventricle, according to him, being affected in half the cases. He explains this fact by the protracted course of the disease, and he points out the analogy to cases of unilateral valvular lesion, where the dilatation of the left side of the heart finally extends to the right.

The theoretical explanation of the hypertrophy of the heart and of the coats of the arterioles to which Ewald inclines is the following:—The blood becomes altered in its composition by the renal disease, and excites increased resistance in the capillaries. Increased tension in the arterial system is the result, and then first hypertrophy of the heart, and later on arterial hypertrophy. The latter he regards as of purely mechanical origin, and dependent on the persistently increased contraction of their muscular coats, which is necessary to prevent their extreme dilatation under the abnormally high lateral pressure to which they are subjected. He believes that this contraction of the arterioles is not dependent on the influence of the vaso-motor centre. The reason why hypertrophy of the small vessels is absent in renal disease complicating heart disease, in atheromatous degeneration of the large blood-vessels with cardiac hypertrophy, and in uncomplicated valvular disease, is probably that here the arterial tension is not *uninterruptedly* high, as it is in interstitial nephritis with contracting kidney. (*Medical Times and Gazette*, July 27, 1878.)

Subcutaneous Injection of Hydrate of Chloral as a Hypnotic.—Dr. Urtel has injected doses of 0·5-3 grams of a solution of chloral composed of one part of chloral to one of water, and later of two of chloral to one of water. He has by this method administered 1·25 grams of chloral. Sleep was quickly caused in the most obstinate cases. The drug failed in only eighteen out of 142 nights, and it was generally due in these cases to an insufficient dose. No signs of poisoning were noticed, but considerable pain was felt at the point of injection and in the surrounding parts. Five and a half per cent. of the injections gave rise to ulceration at the point of injection. This method of administration appears to be worthy of a trial after all other measures have been in vain tried. (*Med. Chir. Rundschau*, Jan., 1879.)

Therapeutic Value of Condurango Bark in Cases of Cancer of the Stomach.—I. von Dietrich reports two cases, in one of which Condurango bark proved extremely useful in cancer of the stomach. The successful case was a woman aged 49 years, who had suffered for ten years from pain in the stomach; for three years had noticed a tumour in the umbilical region, and who had been confined to bed for six months with all the symptoms of well-marked cancerous cachexia. After using the Condurango for four weeks the tumour was reduced to a quarter of its original volume, the patient again became able to work, and a month later only perceived slight hardening, and was otherwise quite well. In the unsuccessful case the patient was 53 years of age, and had for four years suffered from gastric troubles. For the last six months a tumour had been perceived in the gastric region, accompanied with severe pain, vomiting, &c. She took the Condurango for six weeks, but no improvement occurred, and she shortly afterwards died. Dietrich suggests that the Condurango exerts a special action on connective tissue, and hence that cancers containing a large amount of connective tissue are effectually cured by it, whilst the medullary forms of cancer are unaffected. (*Centralblatt f. d. Chirurgie*, No. 1, 1879.)

Nitrite of Amyl as an Antidote to Chloroform.—Dr. Burrall, after considering several cases in which nitrite of amyl has been used with success as an antidote to chloroform, observes that this remedy may be used not only to avert the syncope induced by chloroform, but also the asphyxia. It seems, he says, somewhat strange at the first glance that the same remedy should be useful in such opposite conditions, but in both there is a tendency to stagnation in some part of the vital current, and this is apparently overcome by means of that dilatation of the vessels which is caused by the drug. The effect which it exerts of overcoming stasis seems to be its most important function. While in the syncope induced by chloroform the nitrite of amyl exerts its antidotal properties by opening the arterial channels and admitting blood to the brain; in asphyxia the pulmonary stasis is also overcome, and arterialisation follows. (*The New York Medical Record*, July 20, 1878.)

Chronic Cervical Metritis treated by Interstitial Injection and Dilatation.—Dr. Bennett treats the chronically enlarged os uteri by injecting interstitially iodine, since he has previously obtained good results from its local application, and because he believes that more speedy and lasting results are obtained by bringing the absorbing agent into direct contact with the hypertrophic matter distributed in the midst of the uterine tissue. Acting upon these considerations the patient is prepared both generally and locally. Locally, by relieving any engorgement by local depletion carried out by means of cupping, the frequent use of warm water lavements, and the application of glycerine, so as to induce osmotic action, care being taken to avoid the period of menstrual excitement. The hypodermic syringe is made so long that it may be used with Ferguson's speculum; its points are made of 18-carat gold; and the other portion, which might come in contact with bromine, iodine, or other agent inimical to any metal less resistant than gold or platinum, is mercurially gilt. The instrument should be charged with a solution composed of ten grains each of the iodide and bromide of potassium, to which half a drachm of tincture of iodine and sufficient distilled water should be added to bring it up to two drachms. Three to five punctures, according to the amount of hyperplastic matter to be absorbed, are then made: a cotton pledget, well soaked in glycerine, is placed against the part, and rest enforced for at least twelve hours. Dr. Bennett seldom finds that more than three operations are required, and he has never known any disturbance of moment set up, either generally or locally by its use, but on the contrary has had a number of cases successful when other methods had proved unavailing. The treatment is generally combined with dilatation by means of the sponge tent, which is made use of after the first effect of the interstitial injection has passed off. The only drug administered was the bromide of potassium in large doses, with the double purpose of allaying nervous excitement, and possibly of obtaining some of the benefits described by Professor Binz, of Bonn, who speaks of the potash salts as being positively specific in sub-involution, mythical as it may appear. (*The Dublin Journal of Medical Science*, October, 1878.)

The Treatment of Epilepsy with Curare.—Dr. Kunze states that the old remedies of artemisia, atropia, strychnia, potassium bromide, and ammonium bromide, are unfortunately always unsuccessful in the treatment of epilepsy; that the two bromides only retard the attack for at most half a year; after which it comes on with renewed energy. The treatment of epilepsy being thus in this position, the author has had recourse to curare. Making use of this much-dreaded Indian arrow-poison, Dr. Kunze finds that he is able to administer subcutaneously a dose of 0·03 grammes without any danger. The first appearance of an overdose of the drug is a dulness of vision, accompanied by numbness of sensation. Out of some eighty cases treated in this way, six have received permanent benefit. It is impossible, however, from this number to form any statistics of the effect of treatment by curare. The method of injection was to administer it for three weeks every five days, after which it was discontinued till the next attack. The interval between the last injection and the next attack indicated the time for a fresh injection. This time becomes greater after each administration. The solution injected consisted of Aq. dist. 5·0 grammes, curare 0·3 muc. gts. i.—ii. d.s. for six to eight injections. (*Med. Chir., Rundschau*, Nov. 1, 1878.)

The Therapeutic Value of the Use of Ether with Cod-Liver Oil.—The *New York Medical Journal* gives the following report, made by the Committee on Restoratives of the New York Therapeutical Society, in the use of ether with cod-liver oil. The subject is one of much interest and importance:—

"In 1868, Dr. Balthazar Foster read a paper before the Medical Section of the British Medical Association, on the use of etherised cod-liver oil in phthisis. Referring to the experiments of Claude Bernard, by which it was shown that ether is capable of augmenting the secretion of the pancreas to a remarkable degree, he had reached the conclusion that this discovery opened the way to a great advance in the treatment of phthisis. The defective assimilation of fats being the leading feature in the dyspepsia of phthisis, and this depending upon want of action of the pancreas, it was a clear inference that any agent which would increase the pancreatic secretion would be a valuable adjunct in the treatment of these cases. Moreover, Bernard found that ether promoted absorption independently of the emulsifying action of the pancreatic juice, and thus a double aid was to be expected from its use. Accordingly, Foster administered ether with cod-liver oil to a large number of patients, and preserved careful notes of the results. These results more than justified his expectations, and apparently ought to have led to at least a very general trial of the treatment. But ten years have passed since his paper was published, and only an occasional reference has appeared in the journals, European or American, to this use of ether. Evidently the matter has not been brought sufficiently before the profession, or the success attained by Dr. Foster has not been attained by others. It therefore seemed desirable that more experience upon this point should be accumulated, and accordingly it was selected as one of the subjects for observation by this Committee.

"The shortness of the time over which these observations extend does not allow of any conclusion as to the result upon the progress of the disease of this method of administering the oil as compared with others, even in the limited number of cases of which we have reports; but, so far as the reports go, they have a bearing upon the question of the utility of ether to produce tolerance of the oil, in cases in which the plain oil, or the various emulsions or soaps in common use, cannot be borne. But even in this there is a source of fallacy, which was clearly pointed out by Dr. Squibb, at the last meeting of the Committee. It is that the intolerance of the oil depends, in many cases, on a slight degree of rancidity, which in the first place excites disgust by the offensive taste and smell, producing nausea, if not actual vomiting, and, in the second place, acts as an irritant to the intestinal canal, provoking diarrhœa.

"Now, ether effectually prevents rancidification, and it becomes a question whether, at least in some cases, the good effects of the ether may not be ascribable to this property. That this is not so in every case, however, is shown by the fact that the purest oil, without a trace of rancid taste or odour, is known to have been employed in some of the trials." The report then gives the details of thirty-one cases, and sums up thus:—"In twenty-six of these cases the combination was well borne; in five of them it was not well borne. In the twenty-six cases in which the oil with the ether was well borne, it is noted in twenty-four cases that either pure oil or an emulsion of oil had been tried, and had disagreed. In one case plain oil was found to agree better than the mixture with ether, and in another case the etherised oil did not answer so well as an emulsion with hypophosphites. The ether was given with the oil in twenty-two cases; after the oil—fifteen to thirty minutes in nine cases. Of these nine cases, three had tried unsuccessfully to take the ether *with* the oil, but had exhibited perfect tolerance when the ether was given *after* the oil. The results in this limited number of cases seem to sustain the conclusion of Dr. Foster in a remarkable manner. But it is very important that we should have a large number of cases extended over a longer period of time, and bearing upon the question of the better assimilation of the oil, and therefore of its greater ultimate usefulness, as well as upon its greater present tolerance. And it is especially important that unsuccessful cases should be reported as invariably and as carefully as those which support the claims of the medicine." (*Medical Times and Gazette*, Sept. 22, 1878.)

Neutralisation of Virus.—M. Colin communicates to the Académie de Médicine the results of his experiments upon the neutralisation of virus in the organism. Iodine, carbolic acid, sulphuric acid, hyposulphite of soda, borate of soda, sulphate of iron and sulphate of quinine, have been respectively injected subcutaneously in rabbits affected with malignant pustule. The results attained have been in every case negative. The experiments prove, therefore, according to M. Bouley, that malignant pustule is not subject to any therapeutic agent after it has affected the blood of the inoculated patient. It is found, however, that man offers a certain resistance to the formation of malignant pustule which is not found in rabbits, and that a definite interval of time elapses between inoculation and general infection. Reassuring reservations can therefore be made in the case of the human species when conclusions are drawn from experiments based upon rabbits. (*Arch. Gen. de Med. Dec.* 1878.)

The Treatment of Malarial Fevers with Quinia and Morphia in combination.—Dr. Lewis finds that the combination of an opiate with quinia insures an earlier and more complete cure of intermittent and remittent fevers than quinia alone: that less quinia is required, and hence there is less cerebral disturbance; and that any paroxysm of intermittent or remittent fever may be averted by the use, at the proper time, of a decided dose of morphia and quinia with reasonable certainty. He has been in the habit, therefore, of administering in cases of intermittent fever a ten-grain dose of quinia in combination with a third or half-grain dose of morphia in preference to a twenty-grain dose of quinia alone. He was led to adopt this method of treatment from the fact that less than fifteen grains of quinia, when given alone, were utterly inefficient in a severe case of malarial fever; this quantity of quinine frequently gave rise to distressing tinnitus aurium. By combining therefore the morphia and quinia, severe cases of malarial fever could be relieved by one-half of the former dose of quinia; and thus, owing to the comparatively small dose required, there was perfect immunity from all the annoying cerebral symptoms resulting from the administration of large doses of the sulphate of quinia. (*The American Journ. of the Med. Sci., July,* 1878.)

Neutral Acetate of Lead in Granular Conjunctivitis.—Dr. Pierd'houy employs finely powdered neutral acetate of lead in the following manner, in the treatment of conjunctival granulations: a blunt-pointed hair pencil is slightly moistened, impregnated with a small quantity of the powder, and then brushed lightly over the exposed surface, so as to touch all the granulations. The mucosa must first be carefully cleansed.

He states that incrustations on the cornea are not to be feared, even when ulcers exist. The granulations after the application appear flattened and shrivelled, and are covered with a delicate whitish pellicle. The reaction does not last longer than twenty-four hours, but it is sufficient to repeat the operation every four or five days. The advantages claimed for this method of treatment over that by nitrate of silver or bluestone are that it is less painful, that cicatrices are less likely to form, and that the time required to produce atrophy of the granulations is only about half as long. (*The New York Medical Record*, Oct. 12, 1878.)

[However useful this remedy may be to the general practitioner, we find that it is not generally applicable, inasmuch as grave symptoms occur in cases in which there is any abrasion of the cornea.]

Treatment of Puerperal Convulsions occurring after Labour.—Dr. Hubbard, commenting upon the method of treatment to be adopted in cases of puerperal convulsions occurring after labour, states: 1. That general blood-letting is called for when headache continues after labour is completed, and is attended by flushed face, restlessness, convulsions of a tonic character, and there has been not much loss of blood with the birth of the child. 2. That infusion of digitalis is useful to steady the heart's action, to allay nervous irritation, and also as a diuretic when aided by the addition of bitartrate of potassa. 3. That chloroform should be used sparingly. 4. That, although it was his first experience in the use of hydrate of chloral in these cases, its continuous action was apparently greater than chloroform, and he thought it was less likely to disturb the brain. 5. That, in cases in which there had been great loss of blood, or great prostration attended by nervous exhaustion, dependence might be placed upon hypodermic injections of morphine for controlling the convulsions. He would not resort to chloroform or to chloral under such circumstances, fearing that they might increase the nervous exhaustion, and thereby favour uterine hæmorrhage. The treatment referred to consisted in bleeding to the extent of twelve or fourteen ounces from the arm, with the injection of xv. grs. of hydrate of chloral dissolved in water into the rectum. Infusions of digitalis ℥ij. were administered every four hours, and the patient was kept under the influence of chloroform. The effect of the chloral hydrate was continuous though the dose was small. (*New York Medical Record*, Aug. 10, 1878.)

Treatment in Mental Diseases.—Dr. Fisher, summing up the recent results of treatment in mental diseases, mentions the following. Metallotherapy is based on metalloscopy. The metal is to be administered in some form internally. This M.

Charcot has done as he claims with uniform good results. The benefit of the metallic application is also said to be more or less permanent in hemianæsthesia. Hydro-uranic acid is used by Dr. Hamilton in cerebral hyperæmia as a powerful anæmiant, its action being more intense but more transient than that of the bromides. He considers half a drachm equal to a drachm of bromide of potassium. Dr. Squibb says that the acid as furnished by druggists is extremely variable in strength. It should be a 34 per cent. solution, of which twelve to fifteen minims may be given largely diluted, say in three or four ounces of lemonade with considerable syrup. The bromine in this dose is equivalent to that in ten to fifteen grains of bromide of potassium, but the effect is much greater. Bromide of zinc is a very useful salt in epilepsy, when administered in gradually increasing doses. M. Charcot uses it in the form of pills, and the maximum daily dose reached is twenty-five grains. Tri-nitro-glycerin is used by Dr. Hamilton in place of nitrite of amyl in epilepsy, and for other purposes when the latter is indicated, $\frac{1}{10}$ grain of tri-nitro-glycerin on the tongue. Its action in stimulating the cerebral circulation is immediate and very powerful. Dr. Mery has tried the method advised by Jacobi of Siegberg in fifteen recent cases of general paralysis, as he claims with great success. He proceeds, on the ground that general paralysis is a chronic encephalitis of the frontal lobes, to apply counter-irritation over the anterior part of the scalp. He shaves a space half as large as the hand, and applies tartar-emetic ointment twice. He keeps a suppurating surface open for months, and makes internal use of iodide of potassium. Of the fifteen cases eight were cured, and remained well at the end of two or three years. Four of these, however, were syphilitic cases. (*Boston Med. and Surg. Journ.*, Oct. 17, 1878.)

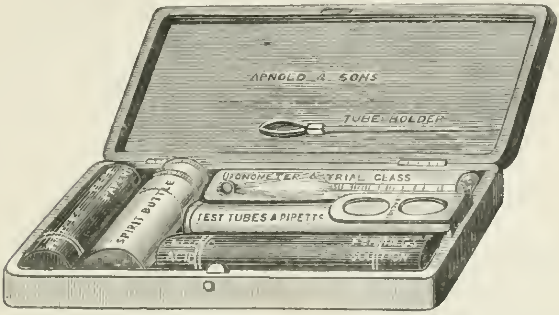
On the Excretion of Carbonic Acid in Fever.—A very important contribution to the pathology of fever has been made by Leyden and Frankel, who published a preliminary account of their investigations in the *Centralblatt f. die. Med. Wissensch.*, for September 28th. A great deal of uncertainty still prevails as to the oxidations which occur during fever, and the results of observations on the excretion of carbonic acid are discrepant. Senator has found in dogs that the excretion is not increased. Leyden, in observations on men, has found a considerable increase—much more than could be accounted for by the oxidation of the carbon of the albumen, whose nitrogen appears as the febrile excess of urea. The present series of observations were made on dogs, in which, after having fasted for several days (during which time repeated estimations of their carbonic acid elimination were made), fever was excited by injection of fresh pus into the cellular tissue of the thigh. By this means a permanent elevation of temperature of from 2°-3·5°C. was produced. Numerous observations were made to determine the normal excretion of fasting dogs in which fever had not been induced, and it was found that in these cases the carbonic acid diminished steadily as starvation continued. From the data thus obtained, it was possible to calculate the ratio of CO_2 in febrile dogs to that which would have been excreted by the same animals at the same period of starvation if fever had not been induced. The result was that, without exception, the excretion of CO_2 in dogs experiences a considerable increase under the influence of the febrile elevation of temperature, and the increase is in proportion to the intensity of the fever. Thus, in one instance, where the elevation of temperature was greatest, the increase of CO_2 was 80 per cent.; in four others 30-40 per cent.; and in two where the fever was moderate, 10-20 per cent. The experiments were made with an apparatus constructed on the principle of Pettenkofer's chamber, and which was large enough to hold conveniently a dog weighing from 20–40 kilos. The authors claim by these experiments to have demonstrated for the first time, by an exact and unobjectionable method, the constant increase which the oxidative processes undergo in fever. The increased oxidation, however, represents only one factor in the production of the high temperature of fever; the second is the altered discharge of heat brought about by the exciting cause of the fever, and which is dependent immediately upon a peculiar alteration in the innervation of the vessels of the skin and lungs. Of the proofs of these alterations in cutaneous circulation, the only one which has been hitherto known is the rigor. The authors record another which has been recently discovered by Bachrach, working under their direction. Certain substances, when absorbed, rapidly pass into the urine, and are readily detected, such as iodide of potassium. Under normal circumstances, iodide of potassium, when given by subcutaneous injection, appears much more rapidly in the urine than when given by the stomach, In fever, however, the reverse is the case—the drug when given by the skin passing much more slowly into the urine than when given by the mouth, thus pointing to disturbed circulation in the superficial parts of the body. (*Dublin Journ. of Med. Sci.,* Nov. 1878.)

Notes and Queries.

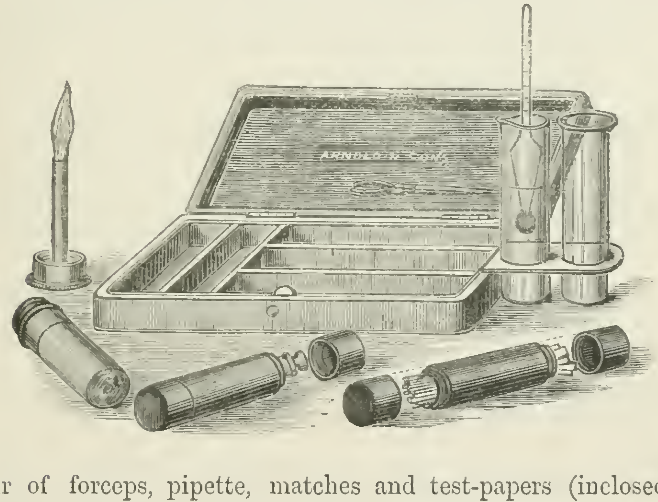
Lens Phœnix Clinical Thermometer.—We have received from Messrs. Harvey and Reynolds a specimen of a new clinical thermometer, in which the difficulties and annoyance arising from the liability of the index getting into the bulb when separated from the main mercurial column by a bubble of air, as it usually does, are overcome by making the main column itself the index. Its return into the bulb is prevented by a contraction which traps it and retains it in its position until shaken. Instead of being cylindrical like ordinary ones, the lens thermometer has a ridge along its whole length, and when seen through this the mercurial column is magnified so as to be easily seen even in a dim light, or by persons with impaired eyesight.

Victoria Ofner Bitter Water.—This water is one of the same class as the Hunyadi Janos water, and is indeed obtained from a closely adjacent spring. It is richer in solids than the Hunyadi Janos water, the latter containing forty-one parts of solids per thousand of water, as compared with fifty-eight parts per thousand of the Victoria water. The amount of sulphate of magnesia is much greater in the latter water, while the former contains more carbonate. The chief advantage claimed for the Victoria water however is not so much its strength as the constancy of its composition, which is secured by special arrangements for bottling. The effect produced by a dose of this water is therefore less likely to vary than the effect of other waters where the same precautions are not employed in bottling. The solid contents of each bottle are also noted on its outside, so that if despite all care its strength should vary a little from the proper standard, the person using it may know it, and regulate the dose accordingly.

Dr. Alexander's Improved Urinary Test-Case, for use at the Bedside.—This case (which we noticed in the *Practitioner* for June, 1877) has been considerably improved by Messrs. Arnold of Smithfield, under direction of its inventor, Dr. Alexander. It has been reduced to the smallest size consistent with *durability* and *practical utility.* It is only 5½ inches long, 2½ inches broad, and an inch deep, and carries trial-glass, inclosing urinometer of improved shape. The nitric acid capillary tubes having been found unsatisfactory and unreliable, a *nitric acid bottle* has been substituted, which is safely carried in an ebonite protecting box. A spirit-bottle, with asbestos indestructible wick, always ready for use, has been substituted for the spirit-lamp. The



bottle containing Fehling's test solution is also carried in an ebonite protecting box. Two test-tubes, brass movable bracket,



pair of forceps, pipette, matches and test-papers (inclosed in ebonite box) complete the case.

Maltine.—This is a concentrated extract of malted barley, malted wheat, and malted oats, prepared by the Maltine Manufacturing Company. Extract of malt is officinal in the German Pharmacopœia, and is very largely used in cases of defective nutrition, both in children and adults, and is employed largely in phthisis as a substitute for cod-liver oil, when it is not well borne by the patient. The present preparation seems to us a very good one, and likely to prove serviceable in those cases in which malt is so largely prescribed in Germany.

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⁂ Any of the foreign works may be procured on application to Messrs. Dulau, of Soho Square, W.C.; Williams and Norgate, of Henrietta Street, Covent Garden, W.C.; or Ballière, of King William Street, Charing Cross.

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Diphtheria, its Nature and Treatment. By Morell Mackenzie, M.D. 8vo. pp. 104. 5*s.* London: Churchill.

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Student's Guide to the Practice of Medicine. Second Edition. By M. Charteris, M.D. Fcap. 8vo. pp. 399, with engravings on copper and wood. 6*s.* 6*d.* London: Churchill.

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The Poisonous Snakes of India. By Joseph Ewart, M.D. Crown 4to. 21 plates (19 coloured). 31*s.* 6*d.* London: Churchill.

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Department of Public Health.

THE REAPPEARANCE OF PLAGUE IN EUROPE.

THE reappearance of plague in Europe, after an interval of thirty-seven years' complete freedom from the disease, is an exceedingly grave fact, which unfortunately has been rendered still graver by the sort of panic it has provoked among the different governments of the Continent, and from which even the government of this country has not escaped.

We have from time to time kept our readers informed of the progress of plague since its reappearance in the East. A brief summary here of this progress, will, however, help to a better understanding of the importance to be attached to the outbreak of the disease in the province of Astrakhan. Since the apparent cessation of plague in Egypt in 1844, after several centuries of prevalence there and in neighbouring countries, eight reappearances of the disease had been recorded in the Levant up to the close of 1874, namely; (1, 2), in Western Arabia, in 1853 and again in 1873-74; (3, 4), in the province of Bengazi, Tripoli, in 1858-59, and again in 1873-74; (5, 6), in Persian Kurdistan, in 1863 and again in 1871; and (7, 8), in Mesopotamia, in 1867 and again in 1873-74. The outbreak of 1873-74 in Mesopotamia was the beginning of a diffusion of plague in the districts bordering the lower courses of the Euphrates and Tigris, before the junction of the two rivers to form the Shat-el-Arab, which continued with intervals of dormancy during the hot season, throughout 1874-75 1875-76, and into 1877. Since the hot season of 1877 plague would appear to have disappeared in Mesopotamia.[1]

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[1] *Report of the Medical Officer of the Local Government Board for* 1877, p. 139.

An offshoot of this diffusion, as it was believed at the time, occurred in 1876, in the towns of Shuster and Dizful, and the surrounding districts, Khuzistan, South-Western Persia. The outbreak of plague in the localities named was very fatal; and it appears to have been the first of a series of outbreaks, which in 1876-77 occurred in Persia. In the winter of 1876-77 the disease manifested itself in more than one locality of the province of Astrabad, near to the south-eastern angle of the Caspian; and in March 1877, Resht was attacked, the capital of the province of Ghilan, lying near to the south-western angle of the Caspian, and on the principal thoroughfare of commerce between Russia and Persia, by way of that sea. The loss of life from plague in Resht and neighbouring villages is estimated at 4,000. The disease was not confined to the town and its vicinity, but showed itself in other parts of Ghilan.

Here then in 1877 plague was at the gates of Russia; and it has now been made officially known that the disease appeared in several parts of that Empire in the course of that year. The medical department of the Russian Ministry of the Interior reports that 251 cases of plague (Siberian plague, as it is termed in Russia) were reported in 1877, of which forty-one occurred in the province of Viatka, and thirty-two in the province of Tchernigov. The mortality was at the rate of 21·5 per cent. of the cases.

Not an inkling of this important fact, of the wide scattering of plague in Europe in 1877, had been suffered to be made public, even in Russia, until after the outbreak in the province of Astrakhan in November 1878. It it now evident that this outbreak is but an incident in a more general dissemination of plague in Russia. The outbreak in Astrakhan is confined at present to an area of about one hundred miles in length, and of a breadth which includes the villages on both banks of the Volga. This infected area lies about mid-way between Tsaritzin and Astrakhan, and the villages are for the most part, if not wholly, occupied by populations engaged in the fisheries of the Volga. None of the villages are large, and the whole population within the infected area is probably not great. But data are still wanting which would permit a detailed statement of facts and figures. The important consideration is that the disease showed itself in so fatal a form that, according to official accounts, every person attacked died. For the moment the malady has nearly, if not entirely, died out.

Having regard to the great interest with which the progress of plague in the East has been followed by the greater number of Continental governments as well as by our own government, and the almost certainty that, sooner or later, the disease would enter Europe again, it might have been expected that when the event did happen which had been foreseen, it would, notwithstanding its gravity, be contemplated at least calmly, if not by the people, certainly by their governors. The reverse has happened. The great governments of Europe have been so terrified by the apparition that, casting aside recent experience, and not waiting for further experience, they have rushed into illusory measures of quarantine and revived the whole barbarous procedures against plague which were the product of the ignorance of the middle ages. Not to be behind hand the British government has even announced its intention of re-establishing quarantine against plague in England.

Russia has surrounded the infected area in Astrakhan with a sanitary cordon and declared a *state of siege* within it! Germany, Austro-Hungary, and Roumania are preparing to attempt to shut out communication with Russia along the whole line of their frontiers, in face of numerous experiences of the futility of such a measure; and they have imposed such restrictions on free intercourse with Russia as well nigh to disorganise commerce. The maritime nations of the Levant are vying with each other in declaring long periods of quarantine on vessels coming from ports, a suspicion of which as to plague betokens really an exceptional force of imagination. The whole proceedings read more like an account of a nightmare than of the doings of rational people. As the scare subsides no doubt better councils will obtain both here and abroad. Should any actual danger of plague threaten this country, fictitious measures of precaution such as quarantine will no doubt quickly be relegated to their proper place, and the large powers which the Sanitary Laws give for dealing with so grave a contingency allowed to be exercised without impediment.

REPORT OF THE MEDICAL OFFICER OF THE LOCAL GOVERNMENT BOARD FOR 1877.

The Report of the Medical Officer of the Local Government Board for 1877 has just been issued from the Parliamentary Press as a supplement to the Seventh Annual Report of the Board. The report fully sustains the high reputation of the department so far as the bulk of its contents is concerned, but we regret to see that the Medical Officer's own report gives, from its extreme brevity, indications that Dr. Seaton has thought it desirable to relieve himself from the labour attaching to report-writing. Indeed, we regret to hear that this gentleman has not fully recovered from the effects of recent indisposition, and that it has been held desirable that he should take a long period of sick-leave from his duties.

The contents of the report are numerous and various, and among them readers will welcome the reappearance of reports connected with the auxiliary scientific investigations of the office. First in order come a series of returns relating to vaccination, and to the inspectorial work of the department. These are followed by certain reports and memoranda. First among the reports is one by Dr. Ballard on an unusual prevalence of enteric fever at Ascot during a period of four years and a half. The conditions of this prevalence were exceedingly complex, and they seemed to Dr. Ballard to resolve themselves chiefly into pollution of milk from a particular dairy, and pollution of a particular source of water-supply under circumstances not before discriminated. The questions relating to these suggested pollutions are to the last degree complicated, and they deserve attentive study. The second report is one by Mr. W. H. Power, on diarrhœa-prevalence in Winchester. Here again the question was peculiarly complicated, and the inquiry rather suggests certain lines of future inquiry than helps to a conclusion as to the matter which forms the subjects of the report. Some obscure condition of soil-moisture appears to be indicated as the determining cause of the diarrhœa prevalence. Then follows an extract from a memorandum by Mr. Netten Radcliffe on the

Reformatory School-ship *Cornwall*, moored off Purfleet, in the Thames. The extracts relate to the probable influence exercised upon the health of the boys on board the ship by the flow of Metropolitan sewage into the river at Barking and Crossness. The observations on this subject were made before public opinion had been excited with regard to the pollution of the Thames from this source, after the loss of the *Princess Alice* steamer, and they will have probably considerable value when the subject shall again come under discussion.

Dr. Ballard's second report on effluvium nuisances arising in connection with various manufacturing and other branches of industry follows this memorandum. This report and Dr. Ballard's first report are noticed in another article.

After Dr. Ballard's report comes a memorandum from the pen of Mr. Netten Radcliffe on the progress of Levantine plague in 1877 and part of 1878, in which the history of the disease is brought down to the period immediately preceding the entry of plague into Russia. The memorandum stops at this point; but it gives a suggestive fact of the probable existence of the disease in the Caucasus. The knowledge of plague in Russia in 1877 has only been made known since this memorandum was published. Following Mr. Radcliffe's memorandum is an important memorandum by the Medical Officer on the systematic action taken in England to prevent the importation of infectious diseases. In this memorandum are shown the principles upon which English sanitary legislation proceeds in this matter and the organisation adopted to give them effect in practice, and it deserves careful study at the present moment. Two official memoranda follow, one, on the duties of sanitary authorities in reference to epidemics of small-pox; and the other, on the steps specially requisite to be taken by Boards of Guardians under the Vaccination Acts, 1867 and 1871, in places where small-pox is epidemic.

The part of the Medical Officer's Report relating to the auxiliary scientific investigations contains two reports, the first by Dr. Klein, on infectious pneumo-enteritis in the pig, a report of quite exceptional interest; the second, by Dr. Thudichum on further researches in chemical biology. These two reports must be reserved for further consideration.

DR. BALLARD ON TRADE NUISANCES.[1]

THE most useful parts of the reports on trade nuisances now in progress of being made by Dr. Ballard to the Local Government Board, are those in which he describes what is done in some places to prevent these nuisances, and what might be done to abate them in other places, where no efforts or none but futile efforts are being made in that direction. One valuable feature about what he says upon this subject is, that it is not open to the charge of impracticability. It is a common experience of medical officers of health, when attempting to deal with such nuisances, to be contemptuously told that they do not know what they are talking about, that they are not sufficiently acquainted with the trade or manufacture they are presuming to meddle with, and that their suggestions for amendments are simply impracticable. At any rate Dr. Ballard's suggestions with relation to this important point cannot thus be stigmatised. He bases what he has to say upon the only true foundation—a large experience, careful observation, such an experience as is only available to one who, as an officer of the central authority, has had afforded him a free *entrée* to all the establishments he has wished to inspect. And he has wisely guarded himself in another way, namely, by candidly taking the leading men in each business investigated into his confidence, and establishing with them such cordial relations that they have, as he tells us in his introductory remarks, freely discussed with him every doubtful point, and in the instance of the more important trades assisted him with their counsel, and by the revision of the proof sheets of his reports. Such a line of conduct on their part, while it is most honourable to them, has been a public service to which Dr. Ballard has given the fullest recognition. Throughout the whole series of reports the reader may easily trace the influence of this admirable spirit in which he has been met by the manufacturers. Very early in the reports the author gives a necessary warning which it would be well for health officers and others who have to deal with such questions not to overlook, namely, that while general principles can be laid down on which the methods of abatement of trade nuisances generally are based, great care must be exercised in their application even in respect of similar trades and similar kinds of effluvia. "Rules of universal application," he says, "can rarely be laid down, for the reason that individual establishments have often peculiarities of working which must be taken into account, while some are wanting in conveniences possessed or obtainable by other establishments." This is as much as to say that each work, the improvement of which is being attempted, must be made the subject of special study, a study which can only be satisfactorily made with the assistance of the managers of the establishment itself. In fact it seems to come to this (and perhaps it is this which Dr. Ballard desires to be gathered from those who can read between the lines) that in dealing with trade nuisances, anything approaching a high-handed meddlesomeness must be avoided by those who seek a successful issue. An English manufacturer has all the virtues and failings of the average Englishman of any other class, he hates intrusion and interference, regards his factory as private, like his dwelling-house, and resists official dictation. But he is reasonable, courteous when his back is not put up, and perfectly tractable, although he refuses to be coerced. And he has a weak side (if it be a weakness) on which he can always be successfully and safely approached, namely, the side which leans to his pecuniary interest. And here encouragement all round may be gathered. "Happily for all parties," says Dr. Ballard, "it is commonly found in practice to be as much to the interest of the manufacturers as of the public that the emanations from offensive processes should be thus arrested. The offensive matters so recklessly thrown away into the atmosphere are often found to be matters which, if collected, are of commercial value, and may often be sold to advantage or utilised on the premises.

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[1] Reports on effluvium nuisances arising in connection with various manufacturing and other branches of industry, by Dr. Ballard. No I., relating to nuisances arising from keeping of animals, for the slaughtering of animals, and from those branches of industry in which animal substances, or substances of animal origin, are dealt with, Report of the Medical Officer of the Local Government Board for 1876 ; No. II. relating to nuisances in which vegetable substances are chiefly concerned, Report of the Medical Officer of the Local Government Board for 1877.

And generally it may be said with truth,—truth established by the experience of others besides myself, who have given attention to the subject—that the use of due means to prevent effluvium nuisances in industrial establishments of all kinds often turns out to be in a variety of ways, direct or indirect, and often unforeseen, conducive to prosperity. This is a fact which those most largely engaged in many of the most offensive businesses now recognise more or less completely. It need scarcely be added that the recognition of this important truth is calculated to facilitate very greatly the action of sanitary authorities in dealing with this class of nuisances."

It is probably not unfair to assume that the two reports now issued are likely to be of more general interest to medical men than the reports which are yet in prospect, inasmuch as they deal with businesses commonly found in most towns, while the latter will deal with chemical trades which are chiefly congregated in special localities. It is of more importance to the ordinary health officer for certain to be told the best mode of keeping cows or pigs, of slaughtering them, and utilising the various kinds of animal refuse, as in tanneries, glue manufactories, gut-spinning establishments, and such like, so as to avoid nuisances, than to be told how Swansea Valley may be cleared of its copper smoke or St. Helen's of the stinging acidity of its atmosphere. For the keeping of horses, cows, and pigs is a necessary and universal element of urban existence, and medical men have no mean opinions about the mischief done where they are so badly kept as to be a nuisance; or to the unfortunate families who occupy mews dwellings in London, or whose houses at South Shields, and other places on the Tyne, are half slaughter-houses and half dwelling-houses. Chemical trade stinks are no doubt sometimes extremely disagreeable, and render life irksome in many ways, but for real serious injury to health they will bear no comparison with the septic emanations which accompany and accentuate the stinks from such trades as we refer to. We are very much mistaken if this will not be a general inference to be drawn from Dr. Ballard's reports when they shall be completed. The mountain will not have been vainly in labour if the result is to show health officers that they have good, earnest, serious, useful work to do everywhere close at their hand, and how to do it, and that they may do worse than attend to such businesses as these, while contentedly awaiting the development of public opinion with reference to the rest. Only one word more. We must call attention to what would appear at first blush to be a very simple matter. Following the lead of his late illustrious chief, Mr. Simon, the author of these reports lays great but also worthy stress upon the great necessity of cleanliness in the conducting of such businesess as are the subjects of his reports. The lesson of cleanliness and tidiness is impressed in nearly every page, and a more important lesson can scarcely be taught. Many trades, such as butchering, leather-dressing, glue-making, and gut-spinning, are nuisances chiefly from the lack of due care in this apparently little matter, and Dr. Ballard has done good service in bringing this fact forcibly under notice. They are notoriously filthy trades, are not rarely contentedly accepted and tolerated as such; and such is the baleful influence of business traditions that neither the heads nor the managers of such establishments, nor the local authorities of the places where they exist, have a notion that all this filthiness is not an essential element of business. But fortunately Dr. Ballard's experience has enabled him to give the *coup de grâce* to this stupid tradition. Taking his reader by the hand, he actually introduces him to two establishments, which he himself had casually visited—establishments where these "filthy" trades are carried on, and by means of photographs taken on the spot under his own direction, shows convincingly that it is possible to conduct the most filthy trades in a most cleanly manner. It would have been impossible, we believe, to have brought home conviction to all parties concerned in a less controvertible manner. Henceforth the word "impossible" must be blotted out of the vocabulary when questions of cleanliness arise in connection with dirty trades.

THE PRACTITIONER.

APRIL, 1879.

Original Communications.

CHAULMOOGRA OIL IN PHTHISIS.

BY I. BURNEY YEO, M.D.

At the end of last September I was requested by Mr. R. C. Lepage to give a trial to the Chaulmoogra Oil, which he was anxious to introduce to the notice of the medical profession in this country, as a remedy for phthisis; and Messrs. Corbyn, Stacey, and Company were so good as to send a supply for my use. My friend Dr. Robert Liveing at the same time sent me word that he had found the use of the oil in cases of leprosy attended with remarkable improvement. I at once commenced its administration in a certain number of cases selected for the purpose of testing its efficacy both in early and advanced phthisis; and as I find inquiries are being made from various quarters, as to the value of this drug in that disease, it may be as well that I should no longer delay to record my experience, although I do not consider that this should be regarded as by any means a complete or final investigation.

Let me say at starting that I have found in several cases an unusual amount of objection to taking this oil, and I have had to use much persuasion to induce patients to persevere with it. I am satisfied that it will be necessary, if its administration is to be long persevered in, to give it in the form of *perles*, even in the case of hospital patients; and it will be to the interest of those who desire to see this remedy largely tried, to provide public institutions with the oil, in this form, at as low a price as possible. The oil when cold is solid, and it is necessary therefore to mix it, after warming, with some other diluent oil. I have used almond oil for this purpose, as it seemed to me desirable if possible to avoid complicating the effects of the chaulmoogra oil with those of cod-liver oil, with which it has been recommended that it should be mixed. The oil has a nauseous odour and taste, and when mixed with cod-liver oil forms a mixture to which I find most patients are very averse. I should also premise that the cases in which I have given it were those of hospital out-patients, and that is the reason why some of them passed rather abruptly from under observation; an untoward circumstance which one must always be prepared for in dealing with persons of that class.

Case I.—This case was a very suitable one for trying the effect of a new remedy, as the disease was in an early stage and limited to a small portion of lung. F. J., a pale youth of 17 years of age, whose father and mother had died of phthisis, came to Brompton Hospital as an out-patient on the 2nd October last, complaining that he had twice within the preceding ten days coughed up a small quantity of blood, about 4 ozs. each time: besides the cough and slight emaciation he had nothing further to complain of. There was dulness over the right apex from the clavicle to the lower border of the second rib, the respiration was harsh at this spot in ordinary breathing, and on deep inspiration, after coughing, there was some crepitation. Pulse 90, temp. 98°·8. To take ten minims of equal parts of chaulmoogra and almond oil three times a day in milk—also a tablespoonful of the nitro-hydrochloric acid mixture three times a day (Brompton Hosp. Pharmacop.). After taking the oil for fourteen days, during which time he had not improved in any way and the cough had become more troublesome, he left London for Hastings; the result being therefore wholly negative.

Case II.—This also seemed a suitable case for testing this remedy, as the disease was recent and limited. J. R., a youth 20 years of age, of strumous aspect, had been complaining for two or three months of cough, with frothy expectoration, dyspnœa, emaciation, night sweats, and loss of appetite. He had always had good health previously, and his parents and his brothers and sisters were all healthy. Pulse very quick, 140, temp. 99°. Tongue coated. Dulness over right apex to third rib, tubular respiration with crepitant râles over corresponding part of lung in front and behind. Ordered ten minims of a mixture of equal parts of chaulmoogra oil and almond oil three times a day, and a tablespoonful of nitro-hydrochloric acid mixture. Iodine to be applied over the affected area. At the end of the first week he said he was worse, the cough was more troublesome, so that he got no sleep; his appetite was very bad, and for the last three or four days he had suffered from pains in the abdomen, and diarrhœa—the bowels acting three and four times a day. To continue the oil, but to have also mist. sodæ bi. carb. c. sp. chloroformi ℥j; with ♏ 20 of tinct. cardamomi comp., three times a day, and to have trochisci ipecac. c. opio occasionally for the cough. This patient after taking the medicine for a month without any improvement ceased to attend; but a report was sent to the hospital three weeks afterwards to say that he was dead.

Case III. was a more advanced one. B. B., a dark complexioned, anæmic-looking girl of fifteen years of age, had been out of health for nearly a year; she complained of slight cough, dyspnœa on exertion, loss of flesh and night sweats; the catamenia had been arrested for twelve months. She came of a healthy family. Pulse 140, temp. 100°. Tongue clean. On the right side there was dulness over the whole of the upper lobe, with largish moist crepitant râles both in front and behind. Chaulmoogra oil was ordered as in the two preceding cases, with ℥j of the mist. quiniæ c. acid nitro-hydroch. (Brn. H. P.) three times a day, and iodine was applied locally. This patient complained of great difficulty in taking the oil on account of its *rising* and its unpleasant taste; she was however urged to continue it and professed to have done so for more than two months, at the end of which time she was rather worse than better. Mr. Henderson of Rickmansworth, under whose care she has subsequently been, writes to me: "She became so much worse that I had to keep her in bed the greater part of the severe weather. The oil seemed to produce so much sickness that I was compelled to alter the treatment."

Case IV.—Considerable improvement attended the use of the oil in this case. T. B., a clerk 17 years of age, with a good family history, had been ailing for six months with cough and expectoration night and morning, loss of flesh, and night sweats. Pulse and temp. normal, tongue coated. Right side resonance diminished all over the front of the chest, with feeble breath, sound crepitation on coughing, some depression of the chest wall over the apex of the lung. Ordered fifteen drops of a mixture of equal parts of chaulmoogra and almond oil three times a day; a tablespoonful of the mixtura ferri. c. sp. chloroformi (Brn. H. P.) three times a day, and an embrocation of turpentine and iodine to be rubbed in over the right lung.

At the end of the first fourteen days the patient reported that he felt stronger, that his cough was better, the night sweats were better, and the appetite was better. At the end of the second fortnight he said he felt still stronger, his appetite was improved, and the night sweats had disappeared. By the end of the eighth week he reported himself as being much stronger, there had been no return of the night sweats, he was gaining flesh, and his appetite was very good. On re-examination of the chest the resonance over the right side had much improved, no moist or crepitant râles could be heard anywhere, but the respiratory sounds over the upper lobe were rather harsh. He left for New Zealand a few days after.

It is impossible in this case to lay much stress on the efficacy of the chaulmoogra oil, as it may be argued that, after all, this may not have been a case of phthisis, but one of somewhat chronic congestion of the lung with pleuritic adhesions about the apex; hence the diffused loss of resonance, the faint crepitant râles on cough, and the retraction of the chest wall over the upper part of the lung; and the chief agents in producing the great amelioration that ensued may have been the tonic iron mixture and counter-irritation which were employed.

Case V.—This was a very hopeless case, but I had been asked to give the oil a trial in advanced cases as well as in early ones, and so I ordered it for this patient. C. T., a girl 13 years of age, had been suffering for twelve months from cough, frothy expectoration, dyspnœa, loss of flesh, and occasional attacks of diarrhœa. Her grandfather, her mother, and an aunt had died of phthisis. She had a very rapid pulse and a temp. of 103°·6. There was dulness all over the right side in front, fluid crepitant râles all over the lung, and cavernous sounds in the upper lobe; on the left side scattered crepitant râles were heard here and there. To take ♏15 of the mixed oils (as above) three times a day; and to have an ounce of the misturæ sodæ bicarb. c. sp. of opium chloroformi with one minim of tincture three times a day. This patient did not attend again and died in a few weeks.

Case VI.—This was an "average" case of phthisis as we meet with it amongst hospital out-patients. J. E., aged 29, a tailor, had been ailing for five months, and suffering from cough, frothy expectoration, loss of appetite and strength, emaciation, night sweats, and occasional diarrhœa. Pulse 110, temp. 101°. Tongue denuded in patches. Right side, resonance diminished over the upper lobe, feeble breath sound, crepitations on cough and whispering pectoriloquy. Left normal. To have twenty minims of the mixed oils three times a day, and a tablespoonful of the mixture bismuth c. gentium (Br. Ph.) an hour before meals. Ipecacuanha lozenge when the cough was very troublesome. At the end of a fortnight his appetite was better, but the cough was "very bad" and the night sweats no better. He complained much of the taste of the chaulmoogra oil and asked if he might not have cod-liver oil instead. I then ordered him the chaulmoogra oil mixed with cod-liver oil. He took this for a month, and at the end of that time he reported himself as certainly "not so well," his cough was worse, he was very feverish, thirsty, sweating much at night: temperature 104°. Physical signs the same as at first. The chaulmoogra oil was discontinued. He was ordered mistura calcis hypophosphitis three times a day, ol. morrhuæ ʒii. twice a day. After eight or nine weeks of this treatment he stated he felt stronger, the cough was better, and the night sweats had disappeared. Temperature 101°·8. The physical signs had improved, the dulness had diminished, and there was less crepitation on coughing.

Case VII.—C. P., a porter, 29 years of age, had suffered from cough for twelve years. Latterly he had been much worse and complained of considerable dyspnœa, loss of flesh, and night sweats. The chest was bulged anteriorily to a great extent, and there were other signs of emphysema, feeble breath sound generally and little or no inspiratory expansion of the chest walls. But in addition there was dulness over the upper lobe on the left side, and fine metallic crepitation. He was ordered twenty minims of the mixture of chaulmoogra and almond oil three times a day; an ounce of the mistura ferri. c. sp. chloroformi three times a day, and the chest to be rubbed every night with the lin. terebinthinæ. This patient, who could not take cod-liver oil, took this mixture of oils without any difficulty. After the first fortnight he reported himself as better and stronger, the night sweats were better, but he was coughing much at night. To take an ipecacuanha lozenge when the cough is troublesome. At the end of a month he said he was still better, he felt stronger, the cough was better, and the night sweats were nearly gone. He did not attend again—but on inquiry it was ascertained that he was unable to get to the hospital and died about six weeks after his last attendance.

Case VIII.—T. T., a young man 23 years of age, had frequently suffered from winter coughs; for the last three months he had been coughing constantly and had occasionally brought up small quantities of blood. He complained also of much dyspnœa, of vomiting in the morning, of emaciation and night sweats. He had lost both mother and father of phthisis. Pulse 110, temperature 100°. On the left side of the chest there was dulness over the whole of the upper lobe with crepitation, and on coughing loud, gurgling râles were heard at the apex. He was ordered fifteen minims of chaulmoogra oil in two teaspoonfuls of cod-liver oil twice a day; an ounce of mistura gentian cum ammonia (Br. P.) an hour before meals three times a day and iodine locally to the chest. At the end of a month there was no improvement. At the end of the second month he appeared no better in any respect, he thought he was worse, he had a return of hæmoptysis, and he protested that he could not continue to take the oil as it made him sick. It was therefore discontinued.

Case IX.—W. C., a clerk 20 years of age, had been suffering for three months from cough, with slight expectoration, dyspnœa, loss of flesh and weakness. Pulse 100, temperature 99°·4. Right side dulness over upper lobe, with tubular respiration, and fine crepitation back and front. On the left side, faint sub-crepitant râles in the superior vertebro-scapular region. He could not take cod-liver oil, so was ordered twenty minims of the mixed chaulmoogra and almond oil three times a day, &c. This patient did not attend again; but sent a report to the effect that he was "not so well."

Of the nine cases then in which I have prescribed this oil since last September—three are dead; one removed to Hastings after taking the oil for a fortnight without any improvement; one found it impossible to continue it on account of the gastric disturbance it produced; one appeared to get decidedly worse during the administration of the oil, became very feverish, his temperature going up to 104°; then on the discontinuance of the oil and the substitution of hypophosphite of lime and cod-liver oil he mended considerably; one after taking the oil for two months was no better, and was allowed to discontinue it, as he complained that it made him sick; one discontinued his attendance after the first fortnight and sent word that he was "not so well"; and one improved considerably.

It is impossible to regard this as a favourable report of the remedial influence of chaulmoogra oil in phthisis. In only one case was there any real improvement, and although that case presented most of the features of phthisis, another explanation of the symptoms was possible, as I have shown, and the improvement may have been due to the strong iron tonic and the counter-irritation which was employed. Nor can it be fairly objected that I submitted the remedy to too severe a test in the cases I selected for its use: they were by no means worse than the average cases of phthisis as they first come under observation amongst hospital out-patients; and they were such cases as are constantly found to be greatly benefited by other remedies. At any rate, I fear it must be concluded that this drug gives no promise of help in well-marked cases, where the disease has reached the stage of infiltration and softening of any considerable portion of either lung. It requires something more than courage to persevere in prescribing a medicine which patients protest they dislike and which one is not in a position to assure them is certainly likely to benefit them; I propose however to give it one or two more trials in the form of *perles,* and in as favourable and early cases as come within my observation.

SULPHUR AS A TOPICAL APPLICATION IN DIPHTHERIA.

BY JOHN A. ERSKINE STUART, L.R.C.S. EDIN., DUNSE, N.B.

While acting as surgeon to the *Egypt*, one of the National Liners, I met with a lady doctor, a Miss Connor, M.D., who was returning to America after finishing her studies in Paris. She informed me that an American physician had lately been using sulphur extensively as a topical application in diphtheria, blowing the powder through a quill on to the membrane, when it became rapidly blackened and came off in a short time.

After returning to this country, I had a case which is valuable, in so far as this method of treatment proved successful. In a recent number of the *British Medical Journal*, Dr. Oertel in his report on the epidemic of diphtheria in the royal household of Darmstadt, in alluding to sulphur, characterises it as a mere "scouring powder," not being of use after fibrinous exudation has taken place, but only when purulent infiltration of the membrane has taken place and the disease is dying out. The result in the case which I now relate seems quite at variance with this statement.

On January 6th, 1879, I was called to the country to see a boy, J. P., aged eight years, who had been complaining since the 3rd of the month of a sore throat. I found him complaining of a bad headache, and of a severe pain shooting out at his right ear. On examining his throat, I found the tonsils much swollen, and of that peculiar deep red colour, so characteristic of the disease, and according to some writers indicative of the disease although no membranes are present. On the inner side of the right tonsil was a patch of membrane, three-fourths of an inch long and one-fourth broad, covering an excavation in the tonsil;

on the left tonsil on its inner side, was another patch of about the size and shape of a sixpence. The submaxillary glands were very much enlarged on both sides. His face and lips were much congested at times, his colour rapidly changing. His pulse was 84 and very weak and intermittent. I at once procured some sulphur and a quill, and blew a considerable quantity on to each patch of membrane.

Next day, his pulse was similar, his temperature 100°. There was no albumen in his urine. His mother continued as ordered blowing the sulphur on to the diphtheritic patches every hour. On the previous evening he was vomiting for a considerable time, and subsequently on examining his throat I found the right patch entirely absent, except a piece about the size of a pin-point. Considerable shreds were detected in the vomited matters. The left patch had considerably increased, but the next day, by perseveringly directing the sulphur to that side in particular, it was reduced to one-half its former size, while on the next visit, two days after, the throat was clear of membranes, although still slightly red. The patient was sitting up by the fire on that day, which was exactly one week from the day he first complained of his throat. One case is not of much use, but perhaps others may be tempted to give the sulphur a fair trial and report progress. In this hope, I have written these notes. That sulphur does blacken the membrane there is no doubt, as I demonstrated for myself in this case. How it detaches the newly-formed exudation (unless by killing it), is a puzzle wanting an answer.

Although the diphtheritic membrane was so quickly dissipated in this case, yet the patient suffered afterwards from a slight attack of paralysis of the larynx and pharynx. Shortly afterwards his elder brother took diphtheria, but the mother by means of the sulphur treatment cured him. A case of this disease, worse than the recorded one, was successfully treated in the above manner by me, about a fortnight ago. In this case, however, swabbing sulphur and water on the membrane took the place of blowing it on.

CHRONIC BRONCHITIS.

BY D. J. HAMILTON, M.B., F.R.C.S. ED., L.R.C.P. ED.,
Demonstrator of Pathology, University of Edinburgh, Pathologist to the Edinburgh Royal Infirmary.

(*Continued from* p. 189.)

THE etiology of chronic bronchial catarrh is so varied that we have thought it best to arrange the subject according to the agents which are instrumental in its production, trusting that our observations on the different forms of the disease may thus be rendered more intelligible. We shall, at present, chiefly examine the condition of the bronchi alone, leaving the description of the pulmonary complications, which almost invariably arise in connection with chronic catarrh of their mucous membrane, until afterwards. The divisions that we propose making in the treatment of the subject of chronic bronchitis are according as it is due to one or other of the following four causes:—

(*a*). An acute attack.
(*b*). Valvular lesion of the heart.
(*c*). Inhalation of foreign matters.
(*d*). Chronic interstitial nephritis.

CHRONIC BRONCHITIS FOLLOWING AN ACUTE ATTACK.

When an attack of acute bronchitis has reached its maximum intensity, one of three things may happen if the patient survives. The catarrhal inflammation may undergo resolution, or it may become complicated with catarrhal pneumonia; or, finally, it may become chronic. The first of these results is usually what follows in persons of robust constitution and in middle life; the addition of a catarrhal pneumonia is, of course, a very serious complication; while the production of a *chronic* catarrhal state of the bronchial mucous membrane, although perhaps not fraught with immediate danger, is the most persistent, and probably the least amenable to treatment. There is little doubt that most of the cases of chronic bronchitis have originated in an acute attack which has never undergone complete resolution, but has left the bronchial wall in a more or less impaired condition, so that the slightest undue exposure is sufficient to cause a great exacerbation of the symptoms. Sooner or later pulmonary and cardiac complications arise, which, taken along with the blocking-up of the air-passages with catarrhal fluid, prove too much for the patient's strength, and give rise to a fatal result. We shall endeavour to show what takes place in the bronchi and their surroundings in such cases, and what the mechanism is which prevents a favourable result being speedily brought about.

The lungs are usually extremely emphysematous, and cover the greater part of the heart in front: their lobules are particularly evident from over-distension, and from the deposit of black pigment lying between them. When the lungs are removed from the chest and cut into, partial or complete collapse takes place. The mucous membrane of the bronchi is much congested and of a deep bluish-red colour; that of the lower part of the trachea is also intensely congested, and of the same cyanotic tint. The whole of the smaller and middle-sized bronchi are filled with yellow muco-purulent discharge, which can be squeezed out in the form of little pellets. This is sometimes extremely viscid, of a greyish colour, and mucus or jelly-like consistence, and adheres firmly to the bronchial wall. The mucous membrane is perfectly smooth and shining: no deficiencies are apparent in it with the exception of the mouths of the mucous glands, which are seen as little pin-point depressions when the light is allowed to fall obliquely upon them. There is no evidence of the surface being in a granulating condition. When looked at a little more closely it can be noticed that the smooth glistening appearance of the mucosa is due to a thin elastic membrane which covers it. If this be touched with a sharp-pointed instrument it will move freely over the inner fibrous coat of the mucous membrane on which t rests. It can, further, be dissected off with a sharp scalpel, and if it be then placed in a neutral fluid, and examined microscopically, it will be found to have the following characters: On its free surface lies the epithelium, or, at any rate, the embryonic forms of it met with in chronic bronchitis, while underlying it are the longitudinal bundles of yellow elastic fibres. It is perfectly homogeneous, has no fenestræ or other apertures in it, and exhibits no cellular structure. If the cover-glass be pressed down so as to endeavour to destroy it, this will be accomplished with difficulty, for instead of breaking into pieces, it will be found to stretch readily, and to retract when the pressure is removed. When treated with glacial acetic acid, no change seems to follow, in this respect resembling the elastic fibres which underlie it. The epithelium, which can be scraped off from its surface, shows comparatively few columnar cells, the usual forms met with being round or "transitional" in character.

The whole mucous membrane is much thickened and thrown into longitudinal folds, and the elastic fibres of the inner fibrous coat can be noticed as greyish-coloured bands running longitudinally. The smaller bronchi are usually dilated, but this depends upon certain circumstances to be afterwards described, the dilatation being by no means a necessary feature. In certain instances the lumen of the larger bronchi seems to be narrowed, from the great thickness of the mucous membrane. The adventitious coat of the bronchi, even where there is no marked interstitial pneumonia, is, also, usually thickened. The bronchial glands are invariably enlarged and pigmented.

In Figure 25 is represented such a bronchus as that just described, transversely cut, after having been specially prepared for microscopic purposes. It was of medium size, and is magnified fifty diameters, and reduced one half. It will be observed, in the first place, that the wall is greatly thickened, and that the mucous membrane is thrown into folds. There is no proper columnar epithelium on the surface, but, in place of this, numbers of small bud-like projections (*a*) are seen on the basement membrane. The thickening in the bronchial wall is almost entirely due to cellular infiltration, which is to be seen not only in the mucous membrane, but extends also to the outer fibrous coat. The muscularis has nearly all disappeared, unless at one spot (*b*), where a few muscular fibres are still left. The glands and cartilages have entirely vanished, their place being taken by dense cellular infiltration. The cause of the irregularity of the free surface in this case seems to be that the cellular infiltration of the mucosa is greater at one part than another; but it will be noticed that in no instance has the smooth outline given to it by the basement membrane broken down. There is a perfectly clean-cut margin, with no evidence of anything like a granulating surface. The mucous membrane of the same bronchus is represented more highly magnified in Figure 26, and will give an idea of the average condition of such bronchi. The true character of the bud-like process, seen with the lower magnifying power, can now be made out. They are the pyriform and rounded catarrhal cells, which are being thrown off from the deepest or flat cell layer of the epithelial

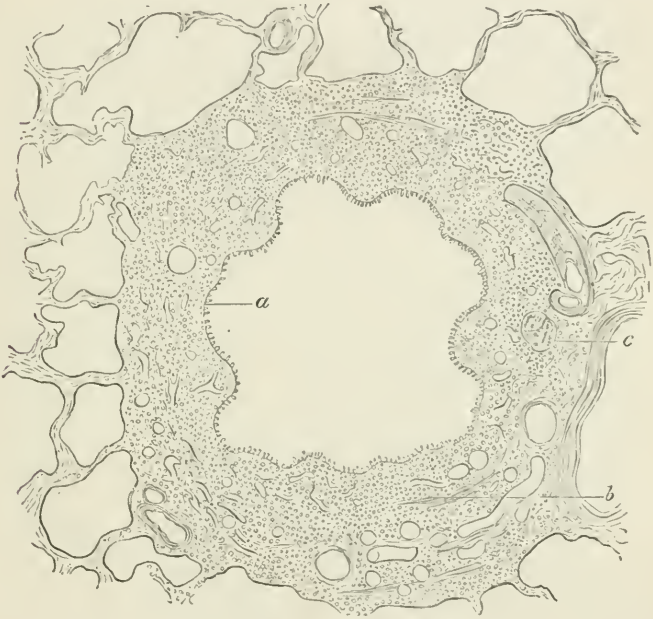

FIG. 25.—Trans. sect. Bronchus in a state of chronic catarrh. × 50 Diams. (reduced one half). *a*, germinating epithelium, placed on basement membrane; *b*, remains of muscularis; *c*, a small nerve.

strata, in the same way as they are cast off in acute bronchitis. Some of the flat cells are seen partially raised from the basement membrane at *c*, and the different stages in the formation of catarrhal cells, from the time when there is a mere oval elevation to where this becomes attenuated and finally detached, are also represented. No fully formed columnar epithelium was found in any part of this bronchus, the whole of the epithelial cells being thrown off in an embryonic condition.

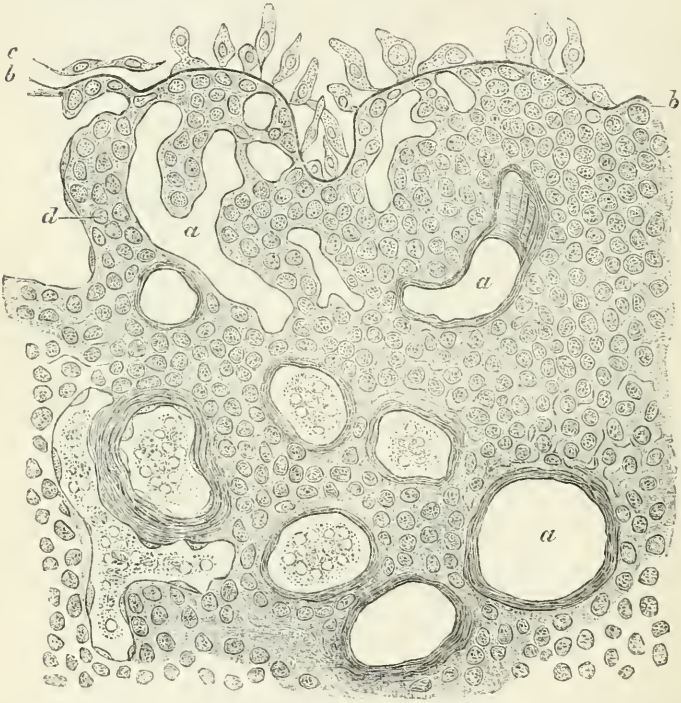

Fig. 26.—Mucosa of bronchus seen in Fig. 25. × 480 Diams. *a*, dilated blood-vessels; *b*, basement membrane; *c*, desquamating epithelium; *d*, small cell infiltration of mucosa.

Immediately underlying the layer of germinating epithelium a dark line is noticed in the figure on which the epithelium rests. It is the elastic basement membrane described above, which, in this instance, was not particularly œdematous, although this is by no means invariably the case. Its underlying attachments cannot be seen, probably on account of the cellular infiltration, but it will be observed to form a continuous layer on the surface and to give the smooth character to the mucosa. Distended capillaries projected into it, and every here and there small ruptures of these, with hæmorrhage into the bronchus, had occurred. We have always found this basement membrane present in chronic bronchitis, and it usually forms one of the best-marked objects. It appears, in some cases, to be much thickened, and to take the place, to a great extent, of the epithelial covering. The question again arises, as in acute catarrh, whether there are any openings or fenestræ naturally present in it, and whether cellular structures are capable of passing through it from below. In chronic bronchitis the underlying inner fibrous coat has its interstitial spaces over-distended with cellular structures, which lie close to the attached surface of the basement membrane, and it becomes a very difficult matter to decide whether they pierce through it and project on the surface. There is a fallacy connected with this observation which would be certain to deceive one at first sight. It is very seldom that the basement membrane can be cut in an exactly transverse direction; the smallest deviation in the perpendicular position of the bronchus, in cutting it, naturally gives a more or less oblique view, so that it cannot all be seen at the same level. It accordingly happens that at one time we see certain cellular structures on the free surface, projecting into the bronchus and undoubtedly having no further attachment than to the basement membrane itself: while at another, by a slight alteration of the focus, several cells corresponding in appearance may be seen at a deeper level, which look as if their attached extremities passed through the basement membrane into the inner fibrous coat, on account of the oblique direction in which it is lying. From the most careful examination of this point in many instances of chronic bronchitis, either where the basement membrane has been œdematous, or where it has had its natural appearance, we are inclined to believe that in this, as in acute bronchitis, nothing of a cellular nature ever gets from below on to its free surface. It seems to form an impenetrable barrier to the exit of leucocytes or other cellular structures, and although it is frequently thrown into folds, from the irregular accumulation of cellular structures under it, yet we have never been persuaded that any of these make their way through it. It maintains its invariably homogeneous aspect, without there being a single break in its continuity. This is evident on examining its relations in Figure 26 ; for although there was exceptionally little œdema in this instance, yet none of the underlying cells appear to have escaped through it.

It will, therefore, be apparent that this is a structure of the greatest importance, for, if it be correct that cellular bodies cannot pass through it from below, it follows that unless the enormous accumulation of such, which takes place in the mucosa in chronic bronchitis (Fig. 25), degenerates, or is got rid of in some other way, the only means of exit, the only direction in which the protoplasmic structures can travel, is outwards. As the accumulation increases, and, consequently, as the pressure from it becomes more marked, we can see that the cells, which lie in the plasmatic spaces of the mucosa, all tend to run outwards; they follow the direction of the lymph stream, and they are very soon found infiltrating the peribronchial and periarterial fibrous tissue. There is not the slightest doubt that the presence of the basement membrane is a most important determining cause in the direction which they take, for if it were not so, there is no reason to believe, after the epithelium is partially shed, that they could not, and would not, wander in towards the free surface of the bronchus, and be thrown off from it as they are from a granulating wound. They would naturally take this direction, being that of least resistance; but, instead of this, they seem to accumulate in the fibrillar interspaces of the inner fibrous coat, until, from their pressure, they distend these sufficiently to permit of their passage outwards into the outer fibrous coat and lobular septa. Their further course will afterwards be traced, and it will be shown that many of the disastrous results ensuing from chronic bronchitis are due to the effect they produce on neighbouring parts.

It would, therefore, seem as if the presence of this elastic, apparently indestructible, basement layer was in reality the great cause of an acute attack of bronchitis becoming chronic ; for if the cellular accumulation in the mucosa, in an acute attack, could easily escape on to its surface, there is every reason to believe that the vessels would regain their wonted tone, and that the epithelium would resume its normal appearance. Indeed, the conviction is irresistible in the examination of such bronchi that if the basement membrane could be broken down or scarified, the cellular pressure on the small blood-vessels would be relieved, and the part would have a chance of resuming its natural functions; or, even, if degeneration of the inflammatory products could be brought about, that the same result would be gained. Such degeneration unfortunately never seems to occur in chronic bronchitis, and the only course evidently left for the inflammatory cells, which have distended the mucosa, to pursue, is to wander outwards, and to get into the surrounding insterstitial tissue of the lung itself. The effect of the basement membrane seems to be very much the same as that of a delicate fascia, in determining the direction that the pus in an abscess will pursue.

The portion of Figure 26 below the basement membrane corresponds to the inner fibrous coat. It represents a bronchus of about the same size as that shown in Figure 2, and, if the relative thickness of the inner fibrous coat in each be compared, an idea may be formed of the amount of cellular accumulation which has taken place. This could hardly be recognised as the same structure as that represented in Figure 2 at *c*.

The enlargement has been produced mainly by the cellular accumulation in its fibrous interspaces, but partly also by the great distension of its blood, and probably also lymphatic, vessels. At the same time its fibrous tissue has disappeared, or its interspaces have become so distended that its fibres can be seen only here and there. The appearance of the inner fibrous coat is more that of an abscess, only that none of the cellular structures within it are becoming fatty. All of them, judging from the varying shapes which they assume, and from the manner in which they adapt themselves to the irregularities of the part, seem to be in an active state of amœboid movement. When traced further outwards they are seen running in lines towards the spaces between the cartilages and glands, and they can be noticed subsequently infiltrating the outer fibrous coat. They are usually about the size of a blood leucocyte, but some of them are a little larger. Their source seems to be the same as in acute bronchitis.

The muscular coat of the small arteries is usually much thickened (Fig. 26), and the capillary vessels, from being channels capable of allowing a single blood corpuscle to pass, are distended into large sinuous spaces. The nuclei of the endothelium in all the blood-vessels are unusually prominent, so that they can be easily noticed on transverse section. There are also numbers of other vessels whose walls seem to be constituted by a single endothelial layer, and which frequently envelope a small artery. They contain a finely granular mass, with cells occasionally in it, and seem to be over-distended lymphatics. They are met with in considerable abundance close to the cartilages.

We saw that in acute bronchitis the muscular coat of the bronchus is not appreciably altered further than by the cellular infiltration which takes place into the spaces between its fibres. When the disease becomes chronic, however, changes of a much more decided character are to be seen in it. Its function seems in great part to be to prevent over-distension of the bronchus in forcible expiratory efforts—a regulating action very much like that of the muscular coat in a small artery. When an artery passes into an organ which is in a state of cirrhosis its smaller branches become much compressed, from the contraction of the newly-formed cicatricial tissue which lies around them. Their lumina are narrowed and the blood has naturally great difficulty in passing through them. Under such circumstances, an increased amount of blood-pressure is thrown upon the main branches, behind the points of obstruction, and no doubt a similar reaction takes place throughout the whole arterial system, to a certain extent. We have invariably found that the muscular coat of such arteries, no matter what the organ may be, is more or less hypertrophied, usually to a very great extent. The lumen of the vessel, at the same time, is *not dilated*, but generally somewhat narrower than in vessels of corresponding size when normal. The explanation that we would give of the production of the muscular hypertrophy in such a case is simply that it is a provision in the artery to resist over-distension, and to prevent the loss of its proper tonicity. There is an undue amount of pressure brought to bear upon the muscular wall from regurgitant pressure, and were some provision of this kind not made, the lumen of the vessel would no doubt become unduly enlarged. This, however, does not take place; it remains of its usual size, or is even smaller than normal. In confirmation of this theory of the cause of the hypertrophy of the muscular coat of the artery, we may compare it with what occurs in vessels unprovided with a muscular coat under similar circumstances. If the lung, liver, and kidneys be examined in regurgitant mitral disease the whole of their capillary system of blood-vessels will be found to be immensely dilated, and their coats attenuated. The same thing would undoubtedly happen in the arteries were there not sufficient muscular hypertrophy to counteract the regurgitant pressure, and to maintain the tone of the vessel.

It has always seemed to us that a comparison can be drawn between the muscular coat of the artery and that of the bronchus under such analogous conditions. The forcible expiratory efforts made by those suffering from chronic bronchitis in coughing must bring a very considerable amount of elastic pressure to bear upon the whole of the respiratory passages, from the glottis downwards, and this pressure, being, when the glottis is closed, equal throughout, will act most deleteriously on the weakest part. We would naturally expect that the air vesicles would suffer most, and the almost constant over-distension of them in chronic bronchitis entirely bears this out. In the human lung they do not seem to contain many muscular fibres in their wall, and having only their natural elasticity to resist the inordinate pressure brought to bear upon them, they dilate most easily of all the respiratory passages. The bronchi, in many cases of vesicular emphysema accompanied by chronic bronchitis, are much dilated, no doubt from the same cause, but always to a less extent than the air vesicles. In similar instances of vesicular emphysema, however, there is sometimes no co-existent dilatation to be noticed in the bronchi; indeed, the lumen often seems to be unnaturally small; and, if a microscopic examination of the muscular coat be made in such a case, we believe that the cause of the non-distension will be found in its hypertrophy. From being a thin delicate lamina of muscular fibres it becomes a layer of thick coarse bundles; and, judging from the manner in which the mucous membrane is frequently thrown into folds in such a case, it has evidently been in a state of tonic contraction. It would, therefore, seem that here the muscular coat of the bronchus plays a part similar to that of the muscular coat of an artery when there is a tendency to over-distension.

What, however, is the state of the muscular coat where bronchiectasy and vesicular emphysema co-exist, and where there is no ulterior cause for the bronchiectasy, such as chronic interstitial pneumonia, or purulent accumulation within the bronchus? A good example of it can be seen in Figure 25, where it will be noticed that it is only here and there that any trace of the muscular coat can be observed. The greater part of it has been supplanted by cellular effusion, and the fibrous tissue of the mucosa has also been mostly removed, its place being taken by inflammatory cellular products. Is it to be wondered at, that such a bronchus, even although the bronchial wall is much thickened, should be less able to withstand forced expiratory efforts? It is more matter of surprise that greater dilatation does not take place than usually happens, the explanation being apparently that the chest wall prevents it. The manner in which the muscular fibres are removed seems to be by simple atrophy. The pressure of the cellular accumulation is so great, that even although the blood supply is abundant, the muscular fibres become resolved into granules, and are ultimately absorbed. Pressure is, no doubt, the direct cause of their atrophy; and although it seems to be mainly due to the cellular accumulation in the mucosa, yet the distended vessels which surround the muscular coat on all sides must materially aid in bringing about this disastrous result. Were the cellular effusion in the bronchial wall to organize into fibrous tissue, an artificial support might be afforded, and bronchiectasy prevented. We do not remember, however, having noticed any fibrous organization, in a case of simple chronic bronchitis uncomplicated with interstitial pneumonia. The inflammatory effusion seems to remain in its embryonic condition; the cells merely wander out into the peribronchial lymphatics as soon as the mucosa becomes over-distended, and fresh accessions are constantly made to replace those which have been thus removed.

The same small cell infiltration is also to be seen in the outer fibrous coat, the fibrous tissue of which, in some instances (Fig. 25), is rendered invisible, either from atrophy or from the distension of its fibrillar spaces with cellular structures. The cellular infiltration is frequently continued into the perivascular fibrous tissue; but here, in addition, the large endothelial cells covering the bundles of fibres are to be seen in a state of germination. The appearance which these endothelial cells in the perivascular fibrous tissue present is very much like that in the peribronchial fibrous tissue in acute bronchitis (Fig. 21), only much more widely distributed. The first deviation that we have noticed is that they enlarge, their periplast becomes more evident than it is normally, and they seem to be raised from the surface of the fibrous bundle on which they lie. The nucleus also begins to participate in the enlargement, soon becomes hour-glass shaped, and subsequently divides, so that most of these large granular cells usually appear to have two or more nuclei. Some of them contain, in addition, a large vacuole, and it very often seems as if the nucleus had escaped from the periplast, and left a vacuole in its place. In other instances the periplast seems to be destroyed, and the nuclei to be set free. In no case, however, do the nuclei appear to die, the ultimate result of the cell proliferation being the production of large dépôts of free nuclei. These are more numerous in some parts than in others, and, usually, where the cellular infiltration is not so extreme as to obliterate the surroundings, loose bands of fibrous tissue are seen running throughout each deposit. When the surroundings of such a small cell collection are carefully examined, it can be noticed that long lines of free nuclei, or, as they might now be termed, small round cells, are continued between the fibrillar spaces of the lobular septa communicating with the bronchial and arterial sheaths. The above described cellular infiltration of the bronchial and arterial surroundings usually extends throughout the whole lung tissue, being, frequently, as well marked near the pleura as round the larger bronchi and arteries.

The cartilages in the bronchial wall, in chronic bronchitis, are more or less altered, the commonest lesion being atrophy and absorption, apparently from pressure; and very frequently no cartilages are to be seen, or only the smallest remains of them, in bronchi which otherwise should have possessed them. The vessels around them are usually abundant, so that their destruction cannot be dependent on malnutrition. It seems to be more the result of direct pressure, the same as that which causes the removal of the muscular coat. The atrophy is always best seen where the cellular accumulation in the bronchial wall is greatest, or where, in addition, the bronchitis is complicated with insterstitial pneumonia.

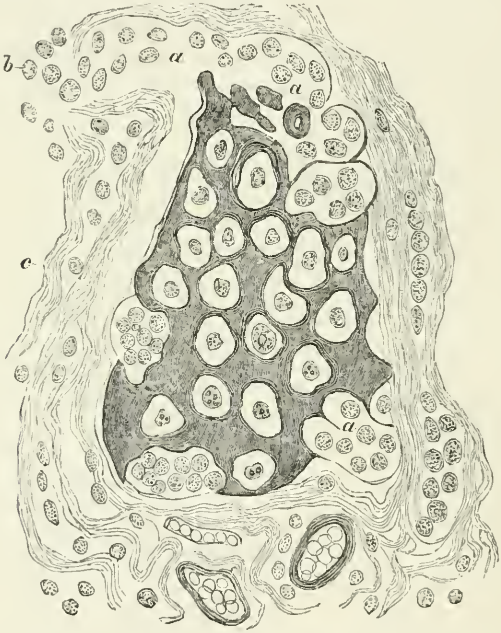

Fig. 27.—Bronchial cartilage undergoing atrophy. × 480 Diams. *a*, large spaces at periphery filled with cells; *b*, the same cells apparently wandering into the spaces; *c*, surrounding fibrous stroma.

The appearance they have is represented in Figure 27. The perichondrium has disappeared, and its place is taken by cellular deposit, or, at least, the cellular deposit has so distended its interfibrillar spaces that it can no longer be recognized. A somewhat wide interval lies around the remains of the cartilage, filled with small round cells. The cartilage itself is misshapen and much reduced in size. Instead of being a smooth bordered ellipse, the continuity of its outline is every now and again interrupted by some irregularity, due to the absorption of the hyaline matrix, forming large spaces (Fig. 27*a*), in which numbers of small round cells are noticed. These cells evidently pass into the absorption spaces from without, as they can be traced in lines continuous with the surrounding cellular infiltration. Portions of detached matrix can also be noticed lying in the cavities, having evidently become separated from the parent mass. What appeared to be newly-formed blood-vessels were also seen running into these cavities, and blood-corpuscles could sometimes be noticed lying in them, apparently resulting from small hæmorrhages. Simultaneously with the occurrence of these changes in the matrix an equivalent process of destruction is noticed in the cartilage cells. Some of them have disappeared, but others have become shrunken or very granular, and frequently one or two oil-globules can be seen in or around them. They were never observed to proliferate, the whole process seeming to be one of atrophy and substitution of extraneous embryonic cellular products in their place. Much the same description of the process has been given by Filz as occurring in the cartilages of bronchi, the subjects of bronchiectasy; and when we consider the structure of bronchiectatic cavities, it will be shown that this process of absorption of the cartilages is one of its best-marked features. There cannot be the slighest doubt that the removal of the cartilages must materially aid in the formation of certain kinds of bronchiectatic cavities; and, further, their place being occupied by embryonic-like cellular products, will tend to favour dilatation.

The mucous glands, in chronic bronchitis following an acute attack, are found in varying degrees of abnormality. They are never in a natural state, and, in some of them, the whole secreting parenchyma and acini seem to be destroyed. This is the result of extreme cellular infiltration of the stroma of the gland. In Fig. 23 a certain amount of this cellular infiltration of the stroma is represented as occurring in acute bronchitis; but in chronic bronchitis following an acute attack, little of the stroma is to be seen, its place having been taken by dense cellular infiltration. Towards the neck of the gland this sometimes amounts to the formation of an abscess, which apparently discharges its contents into the trumpet-shaped opening. Such an abscess is represented in Figure 28. It was placed close to the mouth of a mucous gland, and was about to open into it. It had pushed all the neighbouring tissues aside, and was beginning to soften in the centre.

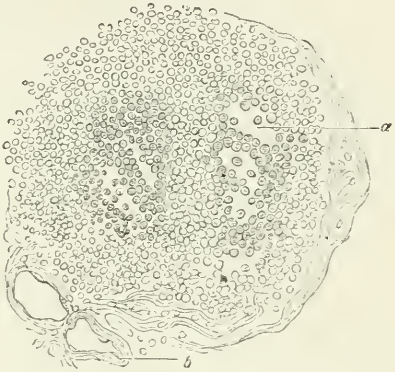

FIG. 28.—Small abscess at mouth of mucous gland. *a*, abscess cavity; *b*, a neighbouring blood-vessel. × 300 Diams.

It is rarely that an acinus is completely invested by epithelium. The secreting cells usually present more or less of the appearance represented in Figure 23, where they are distended with mucus. Their disintegration is also commonly seen. The gland-cells become partially transparent from mucous distension, rupture, and are then resolved into granular débris, their place being taken by new cells, evidently formed from the deeper layer. In certain instances, however, the cellular infiltration of the gland-stroma completely destroys the acini, and the whole gland may then be removed and supplanted by embryonic cellular tissue. The ducts and mouths of the mucous glands are usually much dilated and the cause of the dilatation is, apparently, the accumulation of mucus within them. The epithelium lining the ducts is seldom normal in appearance, the cells being usually more or less transitional in shape.

Atheromatous disease of the middle-sized branches of the pulmonary artery, in chronic bronchitis, is by no means uncommon. We have seen it associated with fatty metamorphosis of the muscular fibres of the heart; but whether the two have any mutual relation we cannot say.

THE THERAPEUTICAL VALUE OF DRUG-SMOKING.

BY REGINALD E. THOMPSON, M.D.

The action of drugs, introduced into the body by various channels, appears, from the experiments that have been made, therapeutically on human beings, and physiologically on animals, to be different, according to the mode of entrance into the system.

This difference of action is chiefly shown in the comparative rapidity and intensity of effect exhibited according as the drug is introduced by mouth, rectum, or under the skin; but a difference in kind may also be observed, and has been recorded in some exceptional instances, arising from some peculiarity in the channel of absorption. In all cases a general effect characterises the introduction of a drug, by whatever channel it may be administered, and a topical action must also be looked for at the locality to which the drug is applied. In addition to these two results, it has been observed in some instances that the absorption of the drug through different media may compel it to play a different part, exemplified by peculiar symptoms induced by its introduction through the particular medium.

From a comparison of the behaviour of drugs under different modes of administration, it becomes evident that the effective portion of the drug which causes the general symptoms must be very small in proportion to the actual dose given, inasmuch as the quantity of the drug requisite for a general effect diminishes with the rapidity of absorption; and it may fairly be assumed that the drug diminishes in quantity in proportion to the amount of tissue through which it has to pass before entering the lymphatics and the blood-vessels. This is especially manifest when the conduct of a drug introduced directly into the blood-vessels is considered; the resultant effects are astonishingly rapid and very intense, even with minute doses, and in such cases the loss from tissue retention must be reduced to a minimum.

There are six channels by which drugs may be made to enter the system:—

1. By the skin externally.
2. By the mouth into the stomach.
3. By the rectum into the bowels.
4. By subcutaneous injection under the skin.
5. By the mouth into the lungs.
6. By the blood-vessels.

Of these six methods the introduction of drugs directly into the blood-vessels by means of a fine syringe is accompanied with so much danger as to preclude their use in this fashion for therapeutical purposes, and the effects of drugs thus given can only be studied in experiments on animals, and from those accidental cases, happily rare, in which a subcutaneous injection has been followed by such speedy and extraordinary symptoms as to lead to the conclusion that a small blood-vessel has been accidently pierced and the injected fluid has thus found its way directly into the circulation.

If this be a just conclusion, then it follows that the less the tissue intervening between the channel of introduction and the blood-vessels, the more rapid will be the absorption, the more intense the effect, and consequently the smaller will be the requisite dose. Considering, then, the special arrangement of the blood-vessels in the lungs as so disposed that the interchange of gases should take place freely with as little let and hindrance as possible, it might be fairly conjectured that absorption through the air passages would more closely approximate to the immediate introduction into the blood-vessels in rate of absorption and intensity of effect than any of the other modes of administration. The inhalation and the smoking of drugs—methods by which medicines may be delivered into the lungs—have, however, been much neglected, and left chiefly in the hands of irregular practitioners of the art of healing, who have taken their advantage to make free use of and to reap a pretty abundant harvest from these most potent methods of administering remedies. The few vapours that are on the list of the British Pharmacopœia are of modern date, and there is a total omission of any means for the pulmonary introduction of drugs by smoking—a form of therapeutics with which probably no practitioner would like to dispense when he has a case of asthma under treatment.

Asthmatic patients, consequently, have to resort to the various patent remedies which are sold for their use, and with which they are generally fully acquainted: the benefit they receive from them is often great and immediate, and the physician is therefore compelled to advise the continued use of secret remedies which are certainly valuable but very objectionable from the empirical nature of their value. Moreover, it is, I conceive, a reproach to scientific knowledge to be outdone and to rest satisfied with being beaten by any one outside the profession, and the reproach is the greater if the secret remedies be only, as seems to be probable, particular combinations (in a special form) of drugs, the use of which is already recognised by the profession. It seemed, therefore, advisable that a series of experiments should be made on the therapeutical value of drug-smoking, and the results that have been obtained are here offered as a preliminary contribution to this important department of therapeutics.

There are several ways in which medicines may be administered into the lungs: by inhalation with steam, as atomised fluids by insufflation; or by fumigation with powders, prepared so as to burn freely in the air; or lastly, by smoking.

A number of experiments were made with powdered leaves, obtained as fresh as possible, and soaked in nitre; and this method of administering remedies may be adopted in some cases with advantage; but for accurate results it is evident that some other method must be used, inasmuch as it is impossible to estimate the effective dose by such haphazard introduction.

The simplest and surest method for such a purpose is the use of paper soaked in a weak solution of nitre to make it burn continuously, and dipped afterwards in the tinctures or solutions of the drugs to be tested, the paper being rolled into cigarettes of uniform size.

In all these experiments I have received the valuable help of Mr. Leach (the head of the dispensing department of the Brompton Hospital for Consumption), to whom my acknowledgments are due.

The first point to settle was the best paper for the required purpose, and after many trials it was found that the Swedish filtering paper, manufactured expressly for the use of chemists, and calculated to leave as little ash as possible after incineration, was the best, being absorbent, burning freely, and giving out but little odour of burnt paper.

In order to make the paper burn with certainty it has to be dipped in a weak solution of nitre, and to prevent too free combustion from the access of air, the cigarette should be rolled of a definite size, not more than a quarter inch in diameter, and the rolling should be as tight as possible.

The most rapid way of rolling is obtained from the use of a stick of the required size, slightly tapering, so that it can be easily removed when the cigarette is finished.

The odour of burnt paper is so disagreeable that it was necessary to disguise it, and it was found that the best addition for the purpose was tincture of tobacco, to which may be added a small quantity of oil of anise.

The following formula represents the basis used for each cigarette:—

Swedish filtering paper, size, 4 in. × 2½ in.	
Potassæ nitratis	gr. ¼.
Tinct. tabaci.	♏ x.
Olei. anisi.	♏ ⅛.

The tincture of tobacco was made with 2½ oz. of the leaf to a pint of spirit.

A solution of any drug which is to be experimented on can then be prepared, and the paper having been floated through the solution in a flat dish, when dry can be cut into a certain size, and the dose thus accurately measured.

The tobacco and nitre had no appreciable physiological effect when smoked by healthy individuals, and their remedial effect on a case of asthma must be considered to be very small.

Opium was the first drug with which experiments were made, and we began by trying the $\frac{1}{8}$th of a grain, but soon found that the effects produced by smoking this quantity were too intense, and finally we came to a conclusion that the $\frac{1}{64}$th of a grain of the extract of opium was sufficient for an initial dose.

Cigarettes with this quantity of opium were smoked by myself and three other healthy men, and in a few minutes a decided effect of dizziness was produced. These were smoked in the ordinary way, the smoke being partly rejected, and a very small quantity of the drug remains in the lungs under these circumstances; if the full effect of the dose be desired, the smoker should be instructed to expand the lungs with full inspiration and retain the smoke in the lungs.

With ordinary smoking it is probable that not more than half the quantity of opium in the cigarette could be counted as effective; so that from the above instances we may conclude that the $\frac{1}{128}$th of a grain of extract of opium can produce an effect when administered into the lungs by smoking.

The following cases may be given as showing the effective action of this extremely small dose:—

Edith C., aged 22, suffering from phthisis of two years standing, with a constant and harassing night cough, which used to keep her awake. She had been having very little rest when she applied for advice. She was advised to smoke one of the above cigarettes at night. Only half a one was smoked at the time, and the report given at the next visit was that she had slept well from 10 P.M. to 9 A.M., and was drowsy when awaked.

Ralph W., aged 24, suffering from phthisis, and subject to night wakefulness. For the last three months he had never slept for more than two or three hours during the night. The use of the opium cigarettes in this case induced sleep for seven hours.

Albert W., aged 30. Chronic asthma of six years duration. Considerable relief experienced from smoking the cigarettes, and undisturbed sleep during the night.

Jane S., aged 30. For two years has suffered from cough, which for some time has been very bad, chiefly at night. Much relief from cigarettes. Cough no longer prevents sleep.

Harriet B., aged 31. Mitral obstruction for some years. Has been under my care since 1877. Complaining lately of harassing night cough, sleeping only two hours during the night. Much relief from cigarettes; sleeping all night.

Thomas T., aged 49. Has been subject to empyœma and asthma for the last seven years. For the last week has been subject to attacks of asthma preventing sleep. Ordered to smoke the cigarettes. No spasmodic attack since using the opium cigarettes. Sleeps now from 9 P.M. to 6 A.M.

John B., aged 40. Asthma for the last two months. Cough and spasmodic attacks have been keeping him awake through the night. The cigarettes produced eight to nine hours' sleep, and prevented the asthmatic spasm.

Eliza S., aged 45, suffering from syphilitic pulmonary disease, with constant cough at night. The use of the cigarettes stopped the cough, and procured good sleep at night.

Eleanor W., aged 24, suffering from bronchitis with destruction of lung. Very tight-chested at night, and kept awake at night. Relief and sleep from the use of the cigarettes.

The dose in the case of one healthy man was increased to $\frac{1}{32}$ of a grain of the extract; but this, together with the same dose of stramonium, caused so much and such prolonged dizziness that such a quantity would be too large for ordinary cases.

That many hours of sleep should have been procured, as in the first instance given above, by so small a dose as the two hundredth part of a grain of the extract of opium is rather startling, and far surpasses the results obtained from the subcutaneous injection, a mode of administering drugs which has hitherto been looked upon as likely to give the most concentrated results.

The smoking of opium is especially adapted for cases of harassing cough; the topical effect of the drug is immediately obtained without any part of the dose being wasted on other tissues; moreover, this mode avoids those objectionable effects which are a bar to the use of the drug when it has to be given by the mouth into the stomach.

Opium-smoking is particularly useful in those cases of laryngeal ulceration in which all attempts at deglutition are accompanied with extreme pain, and the topical effect of the anodyne chiefly sought. It is also useful in those undeveloped forms of asthma which I have already described in a previous number of this journal, as characterised by night cough; and lastly, opium in this form is very serviceable in the dyspnœa of asthma, preventing the night attack by inducing sleep.

In another communication I shall hope to give some results which have been obtained from other drugs administered by the same method, and their comparative value, especially as regards the treatment of asthma.

OBSERVATIONS ON THE LAWS OF HEALING BY DRUGS.

BY WILLIAM SHARP, M.D., F.R.S.

It is certain that the opinion commonly held as to our present attainments in medical knowledge is a mistaken one; that much too high an estimate of its value has been formed; that in fact, medical science is still in its childhood. Few will own this. The majority will say: Have we not large medical libraries, some containing 20,000, perhaps 30,000 volumes? and are not these a proof of the possession of great stores of knowledge? No: if all the pages of theoretical explanations, and with them of incorrectly stated facts and copies were to disappear, as in a dream we might see them vanishing out of these books, there would be nothing left of a vast number of volumes but their two backs, and of the rest only a few pages in each; so that the whole might be included in a small compass. The knowledge thus left would, indeed, be "power," and a diligent student might, in a sense, master it in the years of his pupilage. As the libraries at present exist they are a field in which the blades of truth are smothered by the poppies and thistles of speculation. This is not a flattering statement, but it is true, and it is best to know it.

But truth, like Janus, has two faces; we have seen one; let us now look at the other. These books are the offspring of much labour; their writers were noble, honest, zealous, hard-working men; men to be admired. They lived in the early days of the world, and, therefore, under all the disadvantages of youth; they did what was possible in their circumstances; let us admire them. Their works are in the condition we have recognised, but they teach a priceless lesson; let us not be slow to learn it. The lesson they teach is this: the way of theory is false. Theories, like the waves of the sea, are for ever succeeding each other and perishing. What do we think of past theories? That they are warning sign-posts, with "No road this way!" written upon each of them. Take but one short sentence as a specimen.—"The gums are *solar rays* included in a *viscous balsam;* soot and volatile salts are *culinary heat* joined to an *acid;* and *hence alone* the philosophy of their operation and effects is to be deduced." So wrote Dr. George Cheyne, F.R.S., an eminent physician in his day, and his book on *The Natural Method of Curing Diseases* was, at the time (1742), one of the best, professing to be "founded on Nature and her laws, and a competent knowledge of the animal economy." We call such theories nonsense; our great-grandchildren will give to our theories the same name. The way of theory is false; and, as Addison has it, Falsehood is the mother of Nonsense. Men using their fancy to find theories are like children blowing soap-bubbles. The best that can be said for theories can only show them to be probable; nothing can be said to prove them to be true. This, then, is the second face of the truth shown by our libraries. The first face tells us that the books are filled with theories; the second tells us that the way of theories has been tried long enough. This way is disappointing, because the truth of it cannot be proved; and it is hurtful, because it makes us think that we know more than we do. The result of looking at both these faces is the conviction that the sooner we leave this path and find another, the better it will be for the sick, for medicine, and for ourselves.

Such is the case of our libraries full of medical books, what may be said about medical systems? All these systems have been based upon theories. The theories are unsound, and the systems fall. And we need not regret them. Their practical effects in restoring health and prolonging life have not been what we could wish. A careful observation of these practical effects of the successive systems, not only of ancient but of modern times, will produce a deep conviction that they not only need, out loudly call for, the substitution of a better.

As a proposed substitute, tried both as to its foundations of fact and not of theory, and by its success in restoring health and prolonging life, or where that is impossible, in giving relief and comfort, the evidence in favour of the method described in a former paper[1] is very strong indeed, and more than sufficient to recommend it to a practical trial in the hands of the entire medical profession. In this way it will witness for itself that its basis is true, and that it can give more happy results than any system practised before it; it will then also have the opportunity of receiving improvement and development from the many intelligent and faithful men who will be devoted to it. In this way medical science may arrive at maturity.

In the paper referred to it was attempted to be shown, in the briefest possible manner, what substances may be included in the class of *drugs;* and what inductions, or general facts, may be inferred, provisionally at least, from the experiments already made on man with these drugs in various doses in health and in sickness. Some practical rules, or laws of therapeutics, were suggested as inferences from these facts, and the object of this paper is to make some observations on these rules in the hope of recommending them to my medical brethren as guides in their practice, being well assured that those who will be persuaded to undertake the labour will find themselves abundantly recompensed.

I.—Experiments in Health.

The Seat and Kind of Action of each Drug must be Discovered by Experiments upon Ourselves and Others in Health.

The actions of drugs have been sought to be discovered, in former and present times, in many ways: by watching the stars; by observing the forms and colours of flowers, or other characters of plants; by chemical analyses; by mechanics and mathematics; by pathology; by experiments on animals; and by experiments on the sick.[2] From none of these have they been found. They are still eagerly sought for by experiments upon living animals. They will *not* be found by them alone. And experiments on the sick, notwithstanding centuries of failure, are continued. "The eye of the mind, like that of the body, can only extend its view to new objects by losing sight of those which are now before it." And the eye of the medical mind must lose sight of these experiments upon living animals, and upon patients, as it has done upon so many other methods, and must fix its gaze on a new object—*experiments upon ourselves in health.*

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[1] *The Practitioner* for May, 1878, vol. xx. p. 324.

[2] *Essays on Medicine,* Essay XIX.

Experiments upon the sick are made every day. Some of these are reported, weekly and monthly, in many medical journals. With the most praiseworthy and untiring industry *Retrospects,* preserving the most practical papers containing these reported experiments, have been prepared and published half-yearly for forty years. The conclusion arrived at by this labour —and it is a conspicuous conclusion—is that, during all this time, and from all these innumerable experiments, there has been no fundamental improvement in the treatment of disease. The papers are like insects preserved in amber—objects of curiosity, but of no use.

We have entered the libraries and have studied medical books, and have found a lesson to be learned from them. We have now looked at the practical side, at the work of the profession, which it is doing daily, and this is what we see—enormous labour but no progress; untiring efforts but no improvement! But there is another face of this truth also; let us look at that. These experiments, with all kinds of drugs, in a variety of doses, tried in the sick room, also teach a priceless lesson. Let us not be slow to learn it. They cry with a loud voice—*This is not the way; pursue it no longer; seek a new path!*

It will be said: However true these things may be of the many, there are some physicians who have a considerable amount of real success in the cure of their patients. This is thankfully granted. There are individuals—born medical men—who are endowed with a certain tact and power of observation, which give them this success. Of this power or skill they can give little account, still less can they impart it to others; it dies with them. It is individual talent, not professional teaching. It is a brief light which goes out in darkness. The good to the patients expires with the life of the doctor, and there is little or no permanent gain to the profession.

Experiments on Ourselves in Health.—This is the new path. It is not possible to learn the actions of drugs on the human body in any other way so well as in this. It is the fifth proposition of Euclid. Those who cannot stretch their understandings wide enough to embrace this fact intelligently and heartily, cannot cross this bridge! Every day all grades of medical men prescribe their medicines *ab usu in morbis!*

This is not the true way. Whoever will set himself in earnest to study the effects of drugs, and the effects of different doses of drugs *in health*, and will be guided by these effects in prescribing them for the sick, will find himself raised to a higher level than any of his colleagues, of whatever school, who do not follow him in this work.

The only objection of any weight which talents and knowledge have raised, has been thus expressed:—"I fail to see how reliance can be placed upon your method of proving the effects of drugs upon a person in health, amid so many and various interfering and disturbing and often unsuspected influences." This physician has a large acquaintance with medicines which he has acquired by making experiments on the sick. He fails to see that similar "interfering and disturbing and often unsuspected influences" have been unavoidably associated with these experiments of his; and that there has been, besides all these, another interfering and disturbing influence much more powerful in complicating and hiding results than any other—namely, the presence of disease and its symptoms. He fails to see that experiments in health, being free from this disturbance and complication, approach much more nearly to the simplicity which scientific experimentation insists upon. The rule that in all experiments the conditions shall be simplified as much as is possible, and that results shall be relied upon in proportion to the simplicity of the conditions, makes it a consequence that experiments with drugs in health are more to be relied upon than experiments where disease is present, because of the greater simplicity of the conditions. Those who object to these experiments in health have never made them.

The start in this new path, as far as my historical knowledge informs me, was first made seriously by Stoerck in Vienna in 1760, and by William Alexander in Edinburgh, who jeoparded his life in the attempt (his book is dated 1768). It was suggested, but not attempted, by Haller, in 1771. The path was earnestly pursued by Samuel Crumpe, in Ireland, and the results of his experiments were published in 1793, and Samuel Hahnemann's first essay upon it appeared in "Hufeland's Journal," in 1796 The same method has been followed by the veteran pharmacologist, Professor von Schroff of Vienna, and his pupils, some of whom have run even greater risks than Alexander.

The results of the older observers in the state in which they have been given to us, though much may be learned from them, are unsatisfactory; and, without doubt, the work must be undertaken again. The work of Schroff and his pupils, so far as it goes, is admirable, but it requires extension in the way of experiments on other drugs and on varying doses. The report of each experiment must be given by itself; attention must be directed to the *seat* of the action of each drug, and to the *kind* of action of each dose. Here is work for any number of honest and industrious young men who have been trained in the laboratory to make experiments with correctness, to observe with care, and to note down at once, without preconceived notions, what they have observed.

Experiments with drugs on healthy persons may be looked upon as one of the foundations of the new medical edifice. How rapidly this foundation might be laid if each medical man would undertake the task of testing on himself in health one common plant or one known mineral!

(*To be continued.*)

Reviews.

The Student's Guide to the Medical Profession. By CHARLES BELL KEETLEY, F.R.C.S. 8vo. pp. 64. London: Macmillan & Co.

MANY parents who desire their sons to enter the medical profession are sadly in want of information regarding the preliminary training requisite, the choice of a medical school, the expenses attendant on curriculum, the honours which may be gained during it, the various degrees or licences to practise, and the various appointments or lines of practice by which a medical man may obtain his livelihood. Students themselves are often in want of similar information, and also of hints regarding the details of study, the books and instruments required, the special departments they should attend, and the way in which they should regulate both their work and amusements.

To both parents and students this book supplies a desideratum. It is very concise, very clear, and at the same time gives answers to most of the questions which are likely to be asked. We do not at all agree with the author in his opinion of the value of lectures, nor do we at all recommend the student to follow the advice given by the author in regard to them, but with this exception we consider his counsel to be generally sound, and we would draw especial attention to a chapter in the book by Mrs. Garrett Anderson, meant specially for lady students, but containing advice to all students regarding the cause of break-down during study and its prevention by a proper attention to food, sleep, and holidays. To those who feel the want of information already mentioned, we can recommend this book as supplying it in a form pleasant to read and easy to understand.

The Throat and its Diseases. With one hundred typical illustrations in colour, and fifty wood engravings. By LENNOX BROWNE, Esq., F.R.C.S., Ed. 8vo. pp. 351. London: Baillière, Tyndall, and Cox. Paris: Baillière. Madrid: Baillière.

THIS work is intended as a practical guide to the diagnosis and treatment of diseases of the throat, and being intended chiefly for the use of practitioners, special prominence has been given to the question relating to diagnosis and treatment. It begins with a description of how to use the laryngoscope and rhinoscope, and then gives an account of the anatomy of the larynx, an interpretation of the appearances seen by the laryngoscope and rhinoscope, the semeiology of throat diseases, and their therapeutics, followed by special chapters on individual diseases, a table of laryngeal disease, formulæ, and bibliography.

This book, on the whole, is one likely to be of considerable practical use to those who wish for a ready guide to the use of the laryngoscope and rhinoscope. Its value would, we think, have been increased by a fuller account of the anatomy of the larynx, and by a reference of the laryngoscopic appearances to their anatomical substrata. The most valuable parts of the work are the plates, which are drawn by the author and executed in colours. They give a very accurate idea indeed of the various appearances presented by the pharynx, uvula, tonsils, larynx, and posterior, both in their normal condition and in various diseases. For the sake of these alone, even without the text, it is well worth while for any one desiring to begin the study of laryngeal disease to purchase this work.

Sore Throat. Its Nature, Varieties, and Treatment. By PROSSER JAMES, M.D. 8vo, pp. 288. Third edition. London: Churchill.

THIS work is almost entirely devoted to the symptoms and treatment of sore throat, and very little is said about the methods of of using the laryngoscope. From one who has had so much experience as the author we are inclined to look for some new hints in the way of diagnosis or treatment, but we do not think that any one who has given much attention to diseases of the throat will find either in this work. At the same time, however, those who have given but little attention to the subject of sore throat will find this a useful and handy guide.

Medicinal Plants. By ROBERT BENTLEY, F.L.S., and HENRY TRIMEN, M.B., F.L.S. 8vo. London: Churchill. Parts 32 to 37.

THIS work still keeps up its high character. We notice in the parts recently issued a description and figure of the *Pilocarpus pennatifolius*, the source of jaborandi, *Prunus serotina*, or wild cherry, used in the United States as a nervous, gastric, and cardiac sedative, and the *Hibiscus esculentus*, which yields a mucilage valuable in sore throat and coughs. There is also the *Erigeron canadense*, useful in diarrhœa and hæmorrhage, especially uterine hæmorrhage, and as a local application to enlarged tonsils; and the *Smilax officinalis,* which yields the Jamaica sarsaparilla, and which, notwithstanding the extensive use made of it, has not been previously figured.

Besides the advantage of having figures of little known plants, the practitioner will gain from this work information regarding their uses, and a list of the literature which will enable him to obtain further instruction regarding them from original papers, should he desire it.

Handbook of Surgical Pathology, for the Use of Students in the Museum of St. Bartholomew's Hospital. By W. J. WALSHAM, M.B., F.R.C.S. 8vo, pp. 449. London: Kimpton.

THIS work is intended to help the student to acquire a practical knowledge of pathology. The plan adopted is to give a short general account of each surgical affection, and to illustrate the morbid appearances, stages, terminations, causes and results of treatment by means of selected specimens. The method of arrangement adopted by the author appears to us very satisfactory, and the diseases are described clearly and succinctly. The work appears well adapted to the end for which it was designed; but it is a great pity that its utility should be confined to students of any single hospital. If the author, in a future edition, will only introduce references to and descriptions of some of the specimens in the Royal College of Surgeons, instead of taking them only from the museum of St. Bartholomew's Hospital, he will be doing a service to students of surgery generally, and this we hope he will do both for their sakes and his own.

Pneumono-Dynamics. By G. M. GARLAND, M.D. 8vo, pp. 155. New York: Hurd & Houghton. Boston: H. O. Houghton & Co. Cambridge: The Riverside Press.

IN this work the author takes up the question of the line of dulness in cases of pleuritic exudation, and investigates experimentally the reasons why it is curved and not straight. He distinguishes between the absolute dulness, or, as he terms it, flatness, of the percussion note over the effused fluid, and the dulness of the condensed lung itself. He shows that the letter S curve of flatness, first described by Ellis of Boston, can be traced only in the erect position, and when the lung is not adherent. Its persistence throughout the various stages of effusion indicates absence of adhesion in the lower part of the chest. Its shape corresponds to the lower border of the lung, and its position to the line of junction of the lung and effused fluid. The nature of the effused fluid cannot be diagnosed from variations in the shape of the curve. The reason why the line of dulness is generally believed to be horizontal instead of S-shaped is that a dull triangular space, due to the compression of the lung, exists between the vertebral column and the highest portion of the S curve. This portion of lung, in the erect posture, is not separated from the chest by effusion until the amount of fluid has become relatively very large. The effusion does not at once intrude between the lung and the lateral wall of the chest, but only does so at the very latest stages. A pleuritic exudation does not compress the lung in the manner usually taught; but, on the contrary, exerts a negative pressure by virtue of its weight. The lower part of the lung is not first compressed and then plunged into the fluid beneath, but the entire lung contracts symmetrically throughout. The lung does not, properly speaking, swim upon the effusion, but by virtue of its retractility, supports the weight of the fluid along with the diaphragm, until the weight exceeds the lifting force of the lung. The position and shape of the lung are determined by the balance between its elasticity and the weight of fluid. The position and shape of the effusion are determined by the varying degrees of retractility in different parts of the lung, and by the position of the patient. When the weight of effused fluid is greater than can be balanced by the retractility of the lung, the excess acts upon the diaphragm according to its specific gravity. The diaphragm does not bag downwards until the weight of effusion exceeds the lifting force of the lung, and the same holds good of obliteration of the intercostal spaces. The heart, mediastinum, &c., are not pushed out of place by an effusion either of air or fluid, but are drawn over by the opposing lung. Enormous effusions may increase the displacement. Friction sounds, in the early stage of pleurisy, are not interrupted by the effusion separating the lateral pleural surfaces, but cease because the respiratory muscles of the affected side are weakened, and unable to cause sufficient motion for the production of these sounds. The negative pressure of the lung favours absorption into the pleural cavity. The action of the intercostal muscles favours absorption out of the pleural cavity during inspiration. The negative pressure of the lung favours diastolic repletion of the heart, and impaired retractility of the lung is accompanied by cardiac irregularity, diminished arterial tension, and venous stagnation.

From this summary of the author's results it is plain that he has come to many conclusions different from those ordinarily taught; their correctness seems to be proved by the details of experiments which he gives. The work itself is both interesting and instructive, and will be perused with pleasure and profit by all who are interested in the subject with which it deals.

Dangers to Health. A Pictorial Guide to Domestic Sanitary Defects. By T. Pridgin Teale, M.A., Surgeon to the General Infirmary at Leeds. 8vo, 65 plates. London: Churchill. Leeds: Goodall.

This work is not an ordinary book upon public health and sewage. It appeals to the eye, and conveys its lesson in a most clear and instructive manner by means of plates, with short accompanying letter-press. It is a book which ought to be in the hands of every practitioner; and we believe that by spending half an hour in simply looking over the plates he will gain a much better idea of the various ways in which imperfect arrangements for sewage and ventilation cause danger to health, and of the means to be adopted for detecting and remedying them, than by a prolonged perusal of most other works on this subject.

Pathology and Morbid Anatomy. By T. Henry Green, M.D. Fourth edition. Small 8vo, pp. 440. London: Renshaw.

The popularity of this work has been well shown by the number of editions through which it has already passed. The matter in the present edition has been somewhat altered in arrangement, especially the chapters relating to new formations. We have also an additional chapter on scrofulous inflammation. More than twenty new woodcuts have been added in the present edition, drawn from original preparations, and beautifully executed. These, along with the improvement in the matter, will no doubt add to the well-deserved popularity obtained by previous editions.

Clinic of the Month.

Poisonous Effects of Santonin.—Dr. Labbé has published a series of observations on the dangers which attend the use of santonin. The author ascribes them to the depressing influence which this drug exercises on the central nervous system, and especially on the brain. The symptoms, according to him, are first an indescribable feeling of ill-health, combined with restlessness, a feeling of terror, frontal headache, and sleeplessness. The patient is unable to do any kind of work, either mental or physical; he is in a state of stupor; has epileptiform convulsions; grinds his teeth; in some cases opisthotonos has even supervened; then follows a profound coma, with muscular relaxation and complete loss of consciousness. There are also violent abdominal pains; nausea, vomiting, and diarrhœa occur. The urine is orange-coloured and gives the bile reaction. It seems as if santonin had the effect of suppressing the function of the liver, and retaining in the blood elements of bile. There are dysuria, ischuria, and hæmaturia; and during the comatose stage the urine is passed involuntarily. The respiration is generally irregular and stertorous; the pulse is slow, and the temperature remarkably low. Vision is also much impaired; the pupils are dilated and insensible to light; sometimes transitory amaurosis has been noticed; but the most constant symptom is a kind of dyschromatopsy, which makes all coloured objects appear yellow, orange, or green. It might be suggested that similar accidents can only be caused by large doses; but we gather from a case published by Binz in 1877 that the above-mentioned symptoms appeared in a child aged twenty-five months after the administration of five centigrammes of chloral. In the same case, the muscular relaxation following the convulsions was so strong that artificial respiration had to be resorted to to keep the patient alive. Santonin is not very rapidly absorbed, because the alkaline properties of the intestinal and gastric juices prevent it from dissolving quickly and penetrating into the blood. This explains why the symptoms of poisoning only show themselves very late. In the case mentioned by Binz, they began ten hours after the medicine had been taken and reached their height five hours later. The use of purgatives and diuretics is indicated by the facts related. So long as the santonin has not pervaded the circulation, an aperient will always remove what portion of it still exists in the digestive tracts. If, however, it has been absorbed into the blood diuretics will prove very useful in its elimination. (*The British Medical Journal,* March 1, 1879.)

Poisoning from the External Application of Tobacco.—Dr. O'Neill was called to see a robust woman of 40, who was represented as bleeding profusely from a wound on the leg caused by an accidental blow. The patient suffered from varicose veins. On arrival he found that the bleeding had stopped, but the patient had fainted, and had been only revived with great difficulty. She seemed to be extremely prostrated, having a pulse scarcely to be felt, and a pale cold skin, wet with profuse, clammy perspiration. The pupils of the eyes were dilated, and in a faint whisper she complained of dizziness, dimness of sight, and confusion of thought. The patient suffered from pain in the abdomen, and from constant nausea and vomiting, and on removing the bandages, and examining the leg a handful of chopped wet tobacco was found firmly pressed on the wounds, which were deeply stained by it. The surrounding skin was also stained by the tobacco, but in a slighter degree. Pinches of tobacco had been applied on previous occasions to stop slight bleeding, and after each application the patient had felt rather unwell, but had failed to connect the indisposition with the tobacco. The tobacco was immediately removed, the leg was well cleansed, stimulants were given, and a mixture containing strychnia, which, according to the Rev. Professor Haughton, is the true antidote of tobacco. Under this treatment the patient gradually improved, but did not entirely recover for several days. Commenting upon this case Dr. O'Neill says the symptoms of poisoning were well marked, and are worthy of note when the mode of introduction of the poison into the system and the rarity of such a mode of introduction are taken into consideration. In Lincolnshire tobacco is occasionally used as a domestic remedy for stopping bleeding. In the case under consideration hæmorrhage was arrested; but as tobacco does not contain any astringent substance, the handful of chopped leaves acted in all probability merely as a compress, or as a means of entangling the blood, and thus allowing it to coagulate on escaping from the injured vessel. The urgent symptoms in this case very soon set in, for the patient was seen about three-quarters of an hour after the application of the tobacco, and yet she had fainted in the interval. Absorption therefore must have been rapid, nearly as rapid as if the tobacco juice had been injected subcutaneously. (*Lancet,* March 1, 1879.)

Chloral as an Antidote.—Prof. Huseman of Göttingen, has been engaged in a long series of observations on the antagonistic and antidotal actions of drugs, and some of his investigations, which relate especially to chloral, are described in a recent number of the *Archiv, für exper. Pathologie.* Of these the following is a summary. Chloral hydrate is known to act as an antidote to strychnia, lessening the spasm, and even preventing death. It has a similar action in the case of the mixture of strychnia bases sold under the name of brucin, and also against the opium alkaloid thebaia, which simultaneously tetanises and lessens sensibility. The spasms produced by chloride of ammonium diminish under the employment of non-fatal doses of chloral hydrate, and can indeed be completely stopped. Nevertheless, death occurs, probably from the paralysing effect of both substances on the respiratory centre. The antidotal effect of chloral on the action of the poisons which cause convulsions by their action of the brain is not the same for all these substances. The quantity of the poison which can be counteracted by the antidote appears to be considerably greater in the case of picrotoxin than in the case of codeia. Of the latter, indeed, the fatal dose and even a quantity half as much greater, can be rendered harmless, but twice the fatal dose cannot be counteracted, and is still fatal. Calabarin is counteracted by chloral hydrate in about the same degree as codeia. The symptoms produced in rabbits by poisoning with baryta are not materially altered by the action of chloral, which does not appear to prolong life. So, also, with carbolic acid; the spasms produced by it are not arrested by chloral, and the minimum dose fatal to rabbits still produces death. The combination of a fatal dose of carbolic acid with a non-fatal dose of chloral hydrate causes in rabbits a remarkable fall of temperature, which is not produced by the action of these alone. As a rule, when chloral antagonises the action of these cerebral poisons the respiration sinks in frequency much more than in the case of the analogous action of chloral on the tetanising poison. The depression of temperature caused by the chloral is almost independent of any peripheral loss of heat. The elevation of temperature due to division of the spinal cord is hindered by chloral hydrate. The depressing action of thebaia and codeia on the cerebrum, which is distinctly perceptible in many animals, in addition to their action in causing spasm, is the chief effect recognisable in man. On the other hand, thebaia has a distinct action in lessening pain; and on the other, in human poisonings with this opium alkaloid chloral hydrate is of little use, and in the case of poisoning by codeia, on account of the collapse which is produced, it is positively injurious. (*The Lancet*, March 15, 1879.)

The Pathology of pulmonary Œdema.—A very suggestive paper appears in Virchow's *Archiv* (vol. lxxii. p. 375) by Welch, a pupil of Cohnheim, on this subject. The author first points out the unsatisfactory nature of the causes usually assigned for œdema of the lungs. It is usually assumed that a passive or active congestion is enough to produce it, but in a series of experiments it was proved that it takes an enormous increase in the blood pressure to produce œdema. He tried by obstructing the aortic system to produce it, but was only successful when he had ligatured all the branches except one of the carotids, or one subclavian. Again, in order to produce œdema by obstructing the pulmonary veins, it is necessary to close them almost completely. Hence it appears to be necessary to increase the blood pressure enormously, and no obstruction of the circulation in the human subject is likely by itself to be sufficient to cause œdema. It occurred to the author that if the left ventricle of the heart were weakened, while the right remained acting strongly, there would here be a condition capable of producing a great excess of pressure in the pulmonary circulation. He endeavoured to test this in animals, but it was long before he succeeded in weakening the left ventricle without the right. At last by squeezing the left ventricle in rabbits between the finger and thumb he produced the desired effect, and he found that pulmonary œdema was regularly produced. If this be the cause of pulmonary œdema in the human subject, it will explain many apparent anomalies, such as its sudden occurrence, its appearance in one case, while remaining absent in another case apparently similar; its absence in cases where there is the greatest obstruction to the pulmonary circulation. (*Glasgow Medical Journal,* February 1879.)

A New Symptom of Irritation of the Facial Nerve.—Dr. Leube describes the case of a woman aged sixty-two, who had been suffering from spasmodic tic douloureux for two or three months. It began with conjunctivitis, which was followed by blepharaspasm; the spasm then spread over other branches of the facial nerve. The platysma myoides was the first muscle affected by the spasm, then followed the other muscles of the face. The spasms were so violent that the patient declared she felt as if her whole lower jaw were being torn away. At first there was profuse salivation, but this gradually decreased. The spasms were clonic bilateral and extended to all the muscles supplied by the facial nerves, specially to the orbicularis palpebrarum, and the platysma myoides. The paroxysms followed in quick succession, but sometimes ceased altogether for several hours. When the paroxysm reached its climax, the patient sometimes uttered a peculiar sibilant sound, which could be produced by drawing the soft palate upwards, at the same time contracting the uvula and performing expiration. It was therefore at once suspected that even while the spasm lasted the muscles of the palate were convulsively contracted. This supposition was verified by subsequent laryngoscopic examination during the spasm. If the tongue were slightly depressed it was easily seen that, when the paroxysm was very violent, the palate, which until then had been apparently in a rather relaxed condition, suddenly was contracted and drawn upwards, and the uvula, contracting also, almost disappeared. Dr. Leube, therefore, supposes that the sibilant sound as well as the spasmodic contraction of the palate were due to the part which those branches of the facial nerve that supply the palate took in the spasm. It was not possible to prove whether those fibres of the facial nerve which stimulate the secretion of the saliva were also excited. The treatment consisted in giving Fowler's arsenical solution, either internally or hypodermically, and the results were most gratifying. (*Aerzt. Intellig. Blatt.*, No. 53, and *British Medical Journal,* Feb. 1st, 1879.)

Extracts from British and Foreign Journals.

Treatment of Croup and Diphtheria.—Dr. Taube recommends oil of turpentine and the sub-mucous injection of carbolic acid in cases of diphtheria and croup. The method of application is as follows. The oil of turpentine is inhaled hourly, day and night. An injection of carbolic acid, 3 per cent. is made two or three times a day into the substance of the thyroid to the extent of half a hypodermic syringeful, whilst one or two teaspoonfuls of port or madeira are administered every hour; two or three times daily warm baths, with cold douches and wet wraps are ordered; cold compresses in the shape of ice-bottles to the neck are also applied. Infusions of digitalis 0·580 with 1-2·0 of benzoic acid. The diet is to consist solely of milk and eggs, constipation being subdued with linseed oil. If croupous membranes are formed, copper sulphate is to be given, or tracheotomy is to be performed, whilst fumes of turpentine oil are allowed to pass in and around the cannula. (*Deutsche Zeitsch. f. Prakt. Med.*, No. 36, 1878; *Rundschau*, Heft. 10, 1878.)

Chloral in Retention of Urine.—The patient was eight months advanced in pregnancy. She had been in labour twenty-four hours without passing water. The bladder was greatly distended and extended above the pubes and into the vagina in such a way that the os could not be reached by the finger. The external organs were much swollen, and the pain was intense. Attempts to pass the catheter were ineffectual, owing to the change of position of the urethra. Morphia was administered, and puncture of the bladder was proposed, but was not acceded to. Dr. Tidd proposed to give chloral, as it had been employed with success in cases of very severe retention. A solution of ten grammes of chloral in sixty grammes of water was prescribed, to be administered in small spoonfuls at first every half hour, afterwards every two hours. Deep sleep set in, and the patient was relieved unconsciously of a large quantity of urine. The water was passed five minutes after the second dose of the solution. Seven days later the patient was safely delivered of a healthy child, and there was no return of the retention. (*Arch. Med. Belges; Le Praticien,* Jan. 13, 1879.)

Acne.—Dr. Fox, of New York, in a paper read at the recent meeting of the Dermatological Association, presents his views upon the proper use of this term, with which we think most modern students of dermatology will agree. He would restrict it, like Hebra, to the purely inflammatory affections of the follicles, and would remove from close alliance with it the affection commonly called acne rosacea, a condition characterised by a new formation of vascular and cellular tissue, and in which the sebaceous glands are often only secondarily disordered. The above association, in its recently published system of classification, has removed it from the "inflammations," and placed it under hypertrophies of connective tissue. In a recent lecture upon the general treatment of acne Dr. Taylor gives most excellent practical advice for the management of all forms of the disease, publishing many formulæ which he has tested fully. He believes in the use both of internal and external remedies in the majority of cases, and relies mostly upon alkalies and arsenic among the former, not even failing to commend mercury in some cases. As Dr. Taylor says, the successful treatment of acne depends largely upon attention to details. (*The Boston Med. and Surg. Journ.,* Dec. 5, 1878.)

Experiments with Trichinæ.—Dr. Belfield and Mr. Atwood have been recently engaged in the examination of pork for the presence of trichinæ. The examination was undertaken at the instance of the Department of Health of the City of Chicago. The specimens were procured by a health officer from the different packing-houses in the city, no establishment of the kind having been omitted in his visitations. The flesh of one hundred hogs was examined, and in eight trichinæ were found. The estimated number in each cubic inch of striated muscle of the infected hogs varied from thirty-five to thirteen thousand. A large number of experiments have been made by these investigators to test the rate of propagation of the trichina worm and its effects. Rats have been chiefly used for this study. They have found that a rat may be fed occasionally with small numbers of trichinæ without in any way disturbing its health. One animal, weighing two ounces, was fed with infected pork in small quantities every two or three days for six weeks. No impairment in the health of the rat resulted; it was then killed, and its body was found swarming with living trichinæ; the observers estimated that there were no less than one hundred thousand in the whole carcase. The inference drawn from these experiments has been that any animal or man may take live trichinæ in small numbers occasionally without injury: these gentlemen further believe that many more human beings than has been heretofore supposed are infected with trichinæ; indeed, that the majority of us are carrying these worms about in our muscles. So sure have they felt of this fact that one of them ate twelve living trichinæ on November the 20th. More than three weeks have passed, and not the slightest effect has been experienced. Another interesting result of this study is the discovery that a small portion of sulphurous acid dissolved in the brine in which hams are pickled will kill all the trichniæ. The per cent. of acid required has not been fully determined, but the amount is so small that it is no detriment to the meat for commercial purposes. (*The Boston Med. and Surg. Journ.*, Dec. 19, 1878.)

Treatment of Epithelial Cancer of the Tongue by means of the Elastic Ligature.—Dr. Englisch reports the case of a man, aged 59, who had formerly suffered from rheumatism. Nine weeks previously he noticed a fissure in the middle line of the tongue, which was supposed to be due to excessive smoking, and which steadily increased in extent. On admission to the hospital the diseased surface was ulcerated. The borders were elevated above the adjoining tissue, except in front. The ulcer was about two inches in diameter. The mucous membrane in the vicinity presented considerable increase of epithelial tissue, and the palatine arches were much reddened. The glands of the neck were not implicated. There was no hereditary predisposition. A strong curved needle was passed obliquely through the tongue from above and to the left downwards, and to the right at the posterior part of the tongue. It carried a thin double drainage tube. One loop was then passed over healthy tissue to one side and knotted; the other was brought forward towards the tip of the tongue, and also knotted over healthy tissue. Only a drop or two of blood escaped. The triangular portion enclosed in the two ligatures gradually became paler. The other portion of the tongue swelled to a moderate extent. The ligatures cut their way through in the course of ten days. Healing took place readily. (*Med. Chir. Rundschau,* Heft. 11, 1878.)

Reduction of Temperature and an Elevated Position as a means of Preventing Hæmorrhage.—Dr. Julius Wolff has instituted investigations to determine the quantity of blood in a part according to its position. One of the modes in which this was determined was by estimating the temperature. He found that the influence of elevation of the arm on the temperature of the hand was very remarkable, amounting to five, six, or even seven degrees in the course of a quarter of an hour. If the hand be first cooled down, the vessels remain contracted for many hours, and the temperature does not rise above 76° Fahr., even when the hand is depressed. Wolff therefore recommends that any part of the body about to be operated upon should first be cooled down either by Esmarch's cooling tube, or by cold wraps and cold baths, and that during the administration of the anæsthetic the part should be raised as high as possible. He finds that under these circumstances minor operations on the fingers and toes can be performed absolutely without the loss of any blood at all; whilst in the case of the larger operations, not only is the primary hæmorrhage greatly lessened, but this plan removes the danger of subsequent hyperæmia, in consequence of vaso-motor paralysis, and the increased danger of secondary hæmorrhage, which is apt to occur after the application of the constricting bandage. The only point to be attended to, however, is that the water should not be too cold —it may with advantage be from 15°—29° C. (59°—84° Fahr.) if local baths be employed, or if irrigation be used, 10° C. (40° Fahr.). Professor Wolff reports ten cases in which this practice proved very successful. (*Med. Chir. Rundschau*, Heft. 11, 1878.)

The Treatment of Dysentery with Saline Purgatives. —Dr. Liddell shows, both from his own experience and that of others, that saline purgatives are of great value when judiciously employed in the treatment of dysentery. The treatment consists in the administration of cream of tartar, soluble tartar, Rochelle salts, citrate of magnesia, mineral waters having cathartic properties, and seidlitz powders, and various other saline cathartics in purging doses. The plan of treatment proved most effectual in cases of bilious dysentery, and in cases where the inflammation of the colon was complicated with malarial fever. In such cases the cream of tartar was given in doses of three and four drachms every three or four hours, until large watery motions tinged with bile were produced, and the relief as to all the distressing and dangerous symptoms produced thereby was usually something wonderful. The good results of this treatment are perhaps due to the fact that the large, watery evacuations from the bowels greatly diminished the volume of blood in the portal vein and its tributaries, and in the organs drained by them, *e.g.* the stomach, liver, spleen, pancreas, intestines, thereby lessening the congestion or stasis of the blood in these organs and parts in a corresponding degree, on the one hand; and to another fact that these large serous motions washed off the acrid slime and the scybalous and putrid fæces from the inflamed surface of the bowel, placing it thereby in a condition comparatively free from irritation, and in a state the most favourable for recovery. The cases of dysentery which especially demand the exhibition of saline purgatives are (1) those in which the bowels are habitually constipated, for example, females and people of sedentary habits, for such cases are generally burdened with intestinal obstructions, which can be got rid of only by repeated doses of purgative medicine; (2) cases of bilious dysentery; (3) cases where portal congestion is present; (4) cases complicated with malarial fever, or with malarial intoxication and ague-cake; and (5) cases of chronic dysentery. In all cases the doses should be repeated until bilious and feculent matter appears in the stools. (*The American Journal of Medical Science*, Jan., 1879.)

The Local Treatment of Eczema.—Dr. Piffard recommends nitrate of silver for use during the period of congestion, for the treatment of eczema, the most frequent, and one of the most obstinate of all the cutaneous affections. The form of eczema which frequently occurs on the face, and of which the congestion is prodromal, being characterised by redness, and frequently by a trace of fine desquamation, is best treated by internal remedies, though a great deal of assistance is afforded by external means employed in conjunction with the latter. The indications are to relieve the itching, and reduce the congestion. To accomplish the latter the ordinary well-known astringents may be used. The author has also found that benefit may be derived from the application of a solution of bromide of potassium, rose-water, and glycerin, varying in strength from ten to twenty grains to the ounce. Fluid extract of ergot rubbed up with cold cream, and a similar preparation of arnica-root are also of service. The pruritus which ordinarily ceases with the congestion, may be treated with the ordinary antipruritics, or with hydrocyanic acid, chloroform, &c.; the mixture of chloral hydrate and camphor is also worthy of special mention for this purpose. This mixture, in proportion of 10—20 grains to the ounce of ointment, will sometimes greatly palliate the itching. When special lesions are developed, and the crusts have been removed, the cleansed parts may be benefited by the application of an ointment. Such an ointment is most effectual when it contains some preparation of mercury; the ammoniated mercury, the nitrate, and the black oxide. The two first may be employed in ointments of officinal strength or somewhat diluted, the third in the proportion of ten grains to the ounce. Lead comes next to mercury in usefulness, and is usually employed in the form of ungt. diachyli. This to be of service must be carefully made and quite fresh. The pruritus which is usually present, and sometimes severe, invites attention; Dr. Piffard recommends hamamelis virginica, stramonium and conium applied in ointments. When an acute eczema has passed through the stages of exudation and crusting, and is characterised by redness, dryness, and scaling, it must be treated with some preparation of tar, mixed with simple ointment in the proportion of one or two drachms to the ounce. In chronic eczema irritating applications are needed. Thus hydrarg bin. iod. hyd. bichlor. and potass iod. may be prescribed in ointment. Iodine in tincture, cantharides in collodion, and croton-oil in the form of solid cylindrical sticks. These sticks are made by melting together equal parts of croton-oil and white wax, and pouring the mixture into paper moulds. Hypodermic injection of $\frac{1}{5}$, $\frac{1}{2}$, or 1% of arseniate of soda into the eczematous patch to the extent of 5—10 ♏ has also been found useful. (*The New York Medical Record*, Oct. 26, 1878.)

The Influence of Constitutional Syphilis upon the Course of Wounds.—Dr. Dusterhoff states that the contagious forms of syphilis do not generally exert any influence upon the course of traumatic lesions. A wound subjected to constant irritation during the period of contagion may become the seat of syphilitic efflorescences, without its healing being sensibly retarded. Persistent irritation of a wound, bad diet, and excessive antisyphilitic treatment generally retard the cure more than constitutional syphilis itself. Wounds in the neighbourhood of a primary induration may heal by first intention. Latent syphilis is ordinarily without influence upon the course of a wound. A surgical operation successfully performed in a case of latent syphilis may be followed after cicatrisation by syphilitic manifestations in the position or not of the wound. Autoplastic operations performed on the syphilitic parts often fail, especially if an incomplete course of treatment adopted shortly before the operation has caused the disease to become latent. In this case syphilis appears spontaneously at the seat of the operation. Every subject of syphilitic ganglia ought to be submitted to a course of antisyphilitic treatment before undergoing an autoplastic operation. Tertiary syphilis in a progressive state renders the patient an unfavourable subject for effecting a cure. This is not the case, however, if the patient is passing through a retrogressive stage, or is entirely cured. Syphilis in the bones predisposes to fractures and hinders consolidation. Treatment by mercury does not prevent induration.

but rather assists it. In cases of inveterate syphilis, more especially in syphilis of the bones, wounds are sometimes accompanied by a specific gangrene, which cannot be arrested by any antisyphilitic treatment. There is no reason for supposing that constitutional syphilis predisposes to hæmorrhage from the wounds. Lastly, there is no relation between constitutional syphilis and pyæmia. The above results were obtained more especially with a view to the consideration of the influence of constitutional syphilis upon the course of wounds received upon the field of battle. (*Arch. de Langenbeck*, Bd. xxii. hft. 4, and *Arch. Gen. de Med.*, Feb. 1879.)

Chromic Acid and the Chromates.—In an inaugural thesis upon chromic acid and the chromates studied from a general standpoint, Dr. Rousseau devotes a long chapter to the therapeutic action of chromic acid in some affections of the mouth. The first demonstrates the perfect harmlessness of its use when chemically pure, and he does not hesitate to attribute to the presence of sulphuric or arsenious acid those accidents which it sometimes occasions. In these cases the failure is due solely to the method of preparation. The only inconvenience which attends its use is that in prolonged doses it causes a slight yellow tinge which remains for a considerable period, to appear on the crown of the teeth. Dr. Rousseau dwells upon the utility and efficacy of chromic acid administered in periodic doses in various forms of chronic fungous, and ulcerated inflammations of the gums, in which it appears to act most beneficially. Dr. Magitot also considers that it is valuable in cases of dentary alveolar osteo-periostitis; he has failed, however, to record any cases of its failure, though he has published his successful results. Several other practitioners, however, who have made use of this remedy, have failed to obtain any results, nor is this surprising when it is considered how various are the causes which may give rise to this disease, and under what different aspects it makes its appearance. Thus to mention but one of its causes, the presence of tartaric acid plays a great part in its production, and the treatment in this case would, of course, consist in simply removing the substance which sometimes covers the tooth to the centre of its root. (*Le Progrès Médical*, March 1, 1879.)

The Sedative Action of Quinia on the Neck of the Bladder.—Dr. Simmons calls attention to the fact that the same sedative results upon the bladder may be obtained by the administration of quinia by the stomach, as are generally obtained by injection directly into the organ. This fact was discovered somewhat accidentally, as the patient who suffered from a painful and persistent vesical tenesmus took by mistake fifteen grains of quinia which had been ordered in divided doses, to relieve some symptoms of a malarial character. In about an hour and a half his tenesmus was almost completely relieved, though it returned after eight or ten hours, but with decreased severity. The dose was repeated with the same result, and it was found in the course of two or three days that ten grains morning, noon, and night were sufficient, since there was no pain, though the uncontrollable desire to pass water every fifteen or twenty minutes still continued. Quinia had previously been injected into the bladder in the usual way; the passage of the catheter, however, caused so much pain and bleeding that the patient refused to continue it. He afterwards tried it again for the purpose of testing the value of the two means of administration. He found relief (the medicine by the stomach having been discontinued), but not equal to that obtained by the other method. He then used both at the same time, the quantities of quinia being about equally divided, viz., 15 grains by the stomach and 15 by the urethra. By this plan there has been a decided gain over either separately, so that the patient insists on carrying it out. The time for the effect of the drug to be felt in a relief of the symptoms is about one and a half to two hours, whether the administration is made by the stomach or urethra. This method of administration of quinia by the stomach has since been made with good results in several other cases of severe vesical tenesmus. In relation to this sedative action of quinia upon the neck of the bladder, a question of no little interest arises as to whether the drug acts through the medium of the nervous centres or directly on the terminal nerves of the part, after elimination by the kidneys. (*The American Journ. of Med. Sci.* No. cliii. 1879.)

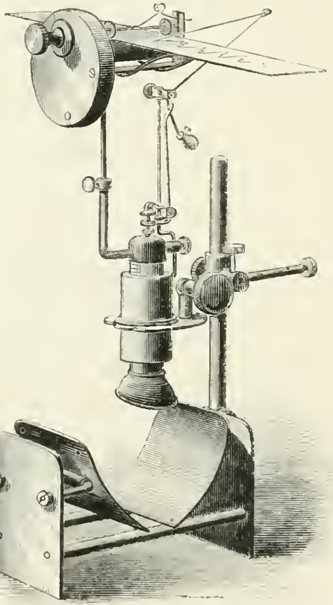
Treatment of Intermittent Fever.—Dr. Kemper uses the formula of Prof. Willebrand, viz.: Iodine grs. xv. iod. potass ℈jss. aqua f. ʒ ijss, M. Five drops largely diluted with water every two hours. This is continued until the paroxysms are arrested, when longer intervals are allowed to intervene between the doses. Recently fifteen patients have been treated in this way. In a majority of cases no paroxysm occurred after the commencement of the treatment. These patients were directed to report themselves, but as yet no failure has occurred. Dr. Craig has used sulphate of cinchonidia with success in this disease. He considers that it is equally efficacious, but not superior to, quinia as a tonic, antiperiodic and antipyretic, and in all diseases where there is malarial complication. It is readily made into a pill by the addition of glycerin, about one drop to each three grains, a three-grain pill not being inconveniently large. It is also very soluble in spirits of nitrous ether, as one ounce will readily dissolve fifty or sixty grains. In the cachexia and anæmia produced by repeated attacks of malaria, accompanied by an enlargement of the spleen, and a pale, bloodless, and icteroid hue of the skin, iron is the great remedy combined with quinia or cinchonidia and strychnia. Cinchonidiæ sulphatis, ʒss, pilulæ ferri carbonatis ʒiss, strychniæ sulphatis, gr. i. M. ft. pil, No. xxx. Sig. one pill ter in die. The above remedies seldom fail to reduce the enlarged spleen to its normal size in a few weeks and restore the patient to health. In the management of cases of malarial cachexia, the removal of the patient to a healthy locality, where practicable is of prime importance. (*The American Practitioner*, Oct. and Nov. 1878.)

Method for the Discovery of Spermatozoa in Urine.—M. Rouvier allows the urine to stand for twelve hours, adding benzine in summer to prevent putrefaction ; he then decants it and collects the flocculent precipitate. This precipitate is put into a test tube, ether is added and the mixture is well shaken. In a few minutes the ether collects on the surface of the liquid as a gelatinous layer. The ether is removed by means of a pipette, and is placed in a conical glass containing a small quantity of distilled water. All the spermatozoa in the urine thus tested are found in a very small compass, and each microscopic preparation will contain at least five or six in the field. (*Gaz. Hebdomadaire. Le Praticien*, March 3, 1879.)

Belladonna in the Treatment of Intestinal Obstruction.—Dr. Norman Ker reports five cases of intestinal obstruction which have been cured by the administration of large doses of belladonna. The treatment consistéd in giving one or two grains of belladonna every hour, together with opiate fomentation to the belly and warm applications. Nearly all the patients were in a dangerous condition, but were entirely cured, the remedy taking effect in six to nine hours. One patient took 16 grains of the extract. The author gives no precise account of the cause of the obstruction. (*Le Praticien*, March 3, 1879.)

Notes and Queries.

Pond's Sphygmograph.—The sphygmograph of Marey has never come into very general use as a means of diagnosis. There are several reasons for this, and one, no doubt, is the time and trouble involved in its application. The present sphygmograph is exceedingly simple in plan, and with it a tracing of the pulse can be taken in almost as little time as, and with very little more trouble than, is required to count it by the fingers. As will be seen from the annexed engraving, this sphygmograph somewhat resembles a spring balance for weighing letters. It



may be simply held in the hand, and thus applied to the wrist, the amount of pressure being at once read off upon a graduated scale. If desired, the instrument may, as in the engraving, be attached to a stand, and pressed down by means of a rack-work upon the wrist, which is laid upon a peculiar sort of rest, which at once adapts itself to an arm of any size. The tracing may be taken either upon blackened paper or glass with a dry point, or upon paper with ink. This instrument possesses the further advantage of being readily applied, not only to the radial artery, but to any artery in the body, and of being used at will as a cardiograph. A mirror may be attached to the writing points, and, by reflecting the light, will make the movements of the pulse or of the heart visible to a large class during a clinical lecture. The instrument is lighter and more portable than Marey's, and the only question which yet remains to be settled by further experiments is whether its tracings are as trustworthy. The inventors of this new sphygmograph claim that they are so, and that their instrument is even more delicate than the old one.

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Department of Public Health.

THE ART OF DOMESTIC POISONING.[1]

WHEN in aftertimes the social peculiarities of the present period shall form a subject for study, few matters, we apprehend, will awaken the interest and enlist the curiosity of the historian more than the licence now permitted in domestic poisoning. And not the licence merely, or, it may be, even primarily, but also the artistic development which this form of poisoning has undergone of late years, and the refined art which it has become. The secret poisoners of the middle ages and of the romantic era sink into insignificance before the domestic poisoners of our own day. The former sought, as a rule, to satisfy some revengeful grudge, or gratify a personal ambition, and proceeded about their work with a barbarous clumsiness hardly tolerable, even in those days of toxicological ignorance and alchemical nonsense (romancists notwithstanding). The latter have reduced the practice of poisoning to a commonplace among the decorative arts, and made it a peculiar feature of our domestic life.

The future historian, aided doubtless by the Owen Jones and the Lacroix of his time, may be called upon to admire the vast variety of design and colour of our wall decorations in paper, and to note the exquisite gradations of tint displayed by the various articles of dress, especially ladies' dress, in vogue. But on pursuing his study further he will be wonder-struck to learn that much of this variety so delightful to the eye was but a fashion of domestic poisoning, and particularly of arsenical poisoning. He will discover that the beautiful greens and blues and greys and neutral tints with which we bedeck our walls, are placed there too often at the cost of intolerable misery to the occupiers of the rooms; that the various adornments of feathers and artificial flowers, in which woman delights, the fairy-like materials in which she loves to appear in the ball-room, and even more intimate articles of her dress, are but vehicles for the dissemination of an atmosphere of arsenical dust about her, or for exposing her to the influence of some irritant poison; that even the drapery of our rooms may contribute to the unhappy fate which dogs us with slow poison within the domestic circle. He will read of the members of this family whose health has been destroyed by the deadly emanations from the walls of their drawing-room or dining-room; of the young children of another family brought to death's door by the picturesque paper by which the nursery had been made bright and charming to the eye; of the individuals of a third family who were poisoned by certain æsthetic bed-curtains. He will read of this learned physician, while working in his library unravelling the mystery of poisons for the benefit of others, himself well-nigh falling a victim to the experimental ingenuity of his upholsterers; also of that ardent student who innocently converts his reading-lamp into a deadly machine by the simple addition of a green shade. He will further read of the careful housewife who, seeking only to poison flies, poisons her family also, by using pleasant-coloured fly-papers, supposed to be harmless to bipeds; and finally, he will come upon facts of poisoned handkerchiefs, and gloves, and stockings, and socks, and shoe-linings, which would seem to be drawn from the region of imagination rather than from the sober records of the present day.

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[1] *Our Domestic Poisons; or, the Poisonous Effects of Certain Dyes and Colours used in Domestic Fabrics.* By Henry Carr, M. Inst. C.E. London: Ridgway, 1879. Sm. 8vo. pp. 50.

And what will most excite his wonder is, that all this mischief is perpetrated unchecked as a merely matter of trade; that it is quite well known, but that it has not been possible up to the present time to bring about any combined public movement for its suppression. We leave to the moral philosopher the question of the probable source of this apathy on a matter which has become no inconsiderable evil. It would seem as if the subject, touching so largely as it does things relating to passing fancies and fashions of the day, were held to stand outside the range of industrial matters in which the Legislature should interfere. And it appears to have been overlooked that the large development which decorative art has undergone of late years, in subjects relating to the house and dress, has multiplied the opportunities for the use of poisonous pigments and dyes in such art, and converted what was at one time a comparatively plain question into a very complicated one. The use of arsenic, for example, in domestic decoration and in articles of dress has become so complex and extended that no simple rule can be laid down for the detection of the poison by the uninitiated; and there is good reason to fear that domestic poisoning from wall decorations and articles of dress has become more common, while the difficulty of tracing the evil to its source, from the larger number of conditions under which the poisonous agency is found, has become much greater. The use of arsenic for the decorative purposes in question is merely a trade convenience; and poisoning in connection with aniline and other dyes seems to be in the main a matter of some carelessness in their application, when it does not arise from arsenic used in their preparation. Except as a mere trade convenience there is no reason why materials apt to exercise poisonous effects should be used in the preparation of the pigments and dyes which are dangerous for decorative purposes in houses and for articles of dress. Even if there were any reason for their use, it could hardly be maintained against the far more important argument to the contrary, derived from an abundant experience of their poisonous effects on individuals and households.

In the pamphlet we have referred to at the beginning of this article Mr. Carr has brought together a quantity of very interesting and instructive information on the subject under consideration, and with a view of obtaining some public action with regard to it. We quote the following illustrations of domestic poisoning from his pages.

The Editor of this Journal, who has been himself a victim to this form of poisoning, states his experience to Mr. Carr in the following words:—

"I believe that colour is no guarantee of freedom from arsenic. The paper which caused so much injury to my own health was a dull green, such as one would hardly suspect to contain arsenic—arsenical greens being generally thought to be bright greens only. I have heard that many other colours contain arsenic, but have no personal experience on this subject. It is not a combination of arsenic and copper only which is injurious, but arsenic when present in wall-papers as a pigment of any kind will do mischief, the injurious action being due to a combination of arsenic with the paste by which they are fixed to the wall. An organic compound of arsenic is thus formed which is exceedingly poisonous, much more so apparently than arsenic itself. For a long time I did not believe in the injurious effects of arsenical wall-papers, because I knew that patients could take as a medicine, without any bad result, more arsenic than they were likely to get from the paper of their room ; and it was only after I had learned, to my cost, how very powerful for evil arsenical wall-papers are, that I became acquainted with the explanation. The most marked symptoms in my own case were severe griping, followed by dysentery, although running from the nose and dry cough were not absent."

The following is from the pen of Dr. Hodges, of Belfast, Professor of Chemistry to the Chemico-Agricultural Society of Ulster. He writes :—

"I beg to give you the following particulars in reference to the effects produced by the green wall-papers which you so kindly analysed for me a few months ago. I bought them last November to paper the walls of the children's day and night nurseries from a shop in Belfast, where I was told they were specially designed for nursery use. I got a paper-hanger in Randalstown to put them up, and he got sick before he had half finished the job, and left his son to finish it out. He has since told me that some green papers always affect him in this way. The paper had not been on ten days before two of the children (there were three in all) began to lose their vigour and animation. They had all been particularly healthy before. One little boy of three and a half years old was the first to show it. His throat became much ulcerated, and he got languid and weak. He was put to sleep in another room for about a fortnight, and his strength and vigour came back again; whereas our eldest little girl, who was still in the nursery, remained as she had been. We had no suspicion at the time that the paper had anything to do with it. On the little boy returning to sleep in the room with the green paper, he again fell back into the state he had been in before, and grew gradually worse and worse every week. We called in the local doctor, but he was quite at a loss to understand the apparent epidemic. The children had by this time become all more or less affected in the same way, also the nurse and Mrs. —— ; whereas all others in the house, who were not in the habit of being in the nurseries, were quite free. From fine healthy children they became weak and fretful ; their necks became swelled and knotted, and their throats very much ulcerated. The little boy wasted away, and could hardly bear to be touched. He would often cower into a corner and cry out with apparent pain if he saw his youngest sister (the least affected) coming near him, to get him to play with her. A Dublin doctor, whom we afterwards consulted, said that their fear of being touched was one of the symptoms of arsenic poisoning. Ultimately it was suggested that the paper was the cause, and on getting your report we at once had it taken off. In a very short time all became well, with the exception of the little boy and eldest girl. The health of the former was so completely undermined that at one time it appeared as if he would

> not recover. I brought him up to Dublin as a last resource and placed him under medical care there, when he gradually got better, and in six weeks he was brought home again fairly restored to health, but not what he was before. The poison has apparently left him with a chronically ulcerated throat, from which, so far, he has never been free; although he never had any throat affection till last November. The little girl is quite well, although for weeks afterwards the swelling came and went in her neck, causing considerable pain. I understand that precisely the same paper is to be found in many nurseries in Belfast and neighbourhood. Surely something should be done to call attention to the matter, or put a stop to the sale of such paper. The fact of the paper having been put up in the winter, when the children were a greater part of their time, both day and night, in either room, no doubt caused them to be affected more than they would be at another time of the year."

Mr. Carr writes:—

> "The importance of medical men being alive to the symptoms of chronic arsenical poisoning is shown in a case occurring in the family of a relative of the writer's. The statement of symptoms given on pages 20 and 21 of this pamphlet were accidentally brought under his notice. He at once sent his nursery wall-paper, one with pictures of green fields, trees, &c., for analysis, and in the following letter he gives the details of the case:—
>
> "'Dr. Stenhouse reports this paper "very arsenical, one that ought not to be used, as it would in all probability seriously injure the health of any one constantly occupying the room where it is hung." What we have ourselves observed is that before the nursery was re-papered the children were healthy and strong; immediately after, they became pale and sickly, and suffered from loss of appetite, peeling of the skin, short dry cough, blinking of the eyes, and in one case ulceration of the leg. When taken from home they got well, but each time on returning the same symptoms recurred. We have grave reasons for thinking that our little boy, lately deceased, was seriously affected by the paper, as nearly every symptom you mention was noticed by us at one time or another previous to his last illness.'"

Mr. Carr suggests that the subject is one for Parliamentary inquiry, with a view to legislation upon it. Meanwhile he would have purchasers as far as possible require a written guarantee as to the freedom of articles supplied to them from arsenic (this suggestion applying in a special manner to wall-papers), otherwise they have no redress against the retailer or manufacturer. Mr. Carr quotes a number of letters addressed to him by distinguished scientific men sympathising with his movement. The most important of these, we take it, in reference to Mr. Carr's object, is from Mr. John Simon. This gentleman writes as follows:—

> "I believe it to be quite certain, and among well-informed persons notorious, that the use of arsenical colours in house decoration and in articles of dress is

a real danger to health, and has in many instances been of serious injury; and I suppose it to be equally certain that the evil will continue, and probably increase, unless those uses of arsenic are prohibited by Act of Parliament."

Here then is the object to be aimed at, and we have no doubt Mr. Carr will receive the hearty aid of the medical profession in the efforts he may make to bring about this desirable result.

DIPHTHERIA: THE QUESTIONS OF ITS DISSEMINATION BY MILK, BY MILK-KINE, AND BY POULTRY.

It would almost seem as if we were about to obtain an insight into some of the more hidden mysteries which have hitherto enshrouded the causation of diphtheria, and which so painfully perplex the physician. Mr. W. H. Power's discovery of an apparent, if not actual, connection between the serious local prevalence of diphtheria in North London in the spring of last year and the consumption of milk from a particular source; his suggestion that the assumed infection of the milk may have been of animal origin; and the more recent suggestion of Dr. Nicati of Marseille of a possible relation between the diphtheria of fowls and the diphtheria of man, open out lines of investigation full of promise. In the interest excited by the suggestion of Mr. Power that the assumed infection of the milk in the North-London outbreak may have been of animal origin, and the discussions to which this has given rise, there is some danger of the evidence upon which the infection of the milk rests being too cursorily treated or largely neglected. Indeed, we think that this has happened more or less already, to the detriment of such inquiry as appears to us should be primarily kept in view, and upon the successful pursuit of which the results of investigation as to the animal origin of an assumed infection of milk must necessarily depend. Clearly it is of first importance to determine the outbreaks in which infected milk may appear to play a part, as they occur, before we can hope to push further inquiries into the source of the infection to a successful issue. Hence it is of essential importance that the mode of research and argument followed by Mr. Power in the North-London inquiry, and upon which he founds his conclusion, should be fully understood. His report on the subject to the Local Government Board is unfortunately too long to be reproduced in full here, and we must restrict ourselves to that part of it which relates to the question of milk infection. The entire report deserves careful study, and it may be mentioned that it has recently been published as a Parliamentary paper, and can now be had at the cost of a few pence.

The outbreak of diphtheria which formed the subject of Mr. Power's inquiry occurred within a circumscribed area in North London which could be inclosed by a circle of a mile-and-a-half diameter. Within this area during the fifteen weeks beginning March 2 and ending June 15 there occurred 264 cases of diphtheria in 118 households, and of these households not less than 78 got their first attacks, numbering 186, during the four weeks ending the 25th May. The special incidence of the disease was most marked in the central portion of the infected area, where during the four weeks referred to no less than 175 new attacks occurred in 70 of the affected households. It was obvious that there was some factor here strongly circumscribed in area and operative during a very limited time. In endeavouring to identify this factor Mr. Power first subjected to careful examination the possible influence of communication between the sick and the well, of local conditions of nuisance from defective sewers or otherwise, and of water-supply, without obtaining a satisfactory clue either to the localisation of the disease or to the abruptness and largeness of its development in the month of May, and to its equally abrupt declension. It is true he found that, five weeks before the "explosion" of diphtheria, there had been considerable disturbance of the working of the sewers in the infected area which could not have failed to render the households within it more or less liable to nuisance from blocked sewers and irruptions of sewer air into their dwellings. The area of this sewer disturbance coincided closely with the area of chief prevalence of diphtheria, and it seemed at first as if there was direct relation between this disturbance and the subsequent outbreak of illness. As Mr. Power observes, "the relation suspected may have been real; indeed, unless other completer explanation be forthcoming, it could not be disputed that the sudden obstruction of the sewers which has been described may in some obscure way may have had to do with the subsequent great development of throat illness" (the phrase which Mr. Power commonly adopts throughout the report). This complete explanation we propose to give mainly in Mr. Power's words. Early in the outbreak Dr. Morton of Kilburn, in whose practice many of the cases of diphtheria had occurred, was struck by the fact that a very large proportion of them used milk coming from the same source; and the more he regarded the subject the more he became suspicious that the fact had some direct bearing upon the occurrence of the cases. Mr. Power tells us that he was not disposed at first to look upon any connection between the milk-supply and the outbreak as probable; but failing to obtain any sufficient clue to the phenomena of the outbreak in the directions of research which our previous knowledge of diphtheria appeared to indicate, he then turned his attention to the question of the milk-supply in relation thereto. What follows is given in his own words:—

> Of the numerous sources whence the milk supply of the area of the outbreak has been derived, two wholesale milk businesses only require particular consideration. Both of them are in the hands of one proprietor, whom I will call Mr. X,[1] and they are situated, the one, cowsheds (to be referred to as X^1), at Kilburn; and the other, a dairy farm (to be referred to as X^2), at Muswell Hill. Although owned by the same person, these two milk businesses are, as regards employés, general administration, and milk-service, wholly distinct one from the other. As regards cows only, and to some extent cow food, have they, so far as I have been able to ascertain, any community of circumstance. Fresh cows are obtained in each instance from the same breeder in the country, and cows are, when occasion requires, subject to transference from one business to the other. Cow food, such as grains and meal, is obtained in each instance from the same sources, and hay is partly supplied to both places from the farm itself. At the period of the outbreak, X^1, the Kilburn cow-sheds, afforded daily some 80 barn gallons of milk. Of this amount, 47 and 24 barn gallons, a constant quantity in each instance, were supplied respectively to Mr. A of Kilburn and Mr. B of St. John's Wood, and by them distributed mainly within the inner circle. Mr. A derived his whole supply, and Mr. B part only of his supply, from this source. The remainder of the total yield of X^1, a quantity varying day by day, but averaging about nine gallons daily, was supplied to and distributed by eight other retail dealers (Messrs. *c*, *d*, *e*, &c., the small letters signifying their small concern in the affair), in Kilburn two, in Portland Town five, and near Dorset Square one. X^2, the dairy farm at Muswell Hill, afforded daily some 50—60 barn gallons, distributed to and retailed by five tradesmen in five different localities as follows:—

Mr. M, Adelaide Road, nine barn gallons; Mr. N, Fortis Green, 19; Mr. O, West Islington, 10; Mr. P, Colney Hatch, 2½; and Mr. Q, New End, Hampstead, 13 barn gallons. In addition, any milk remaining (an uncommon occurrence) after these tradesmen were served was got rid of (directly from this business) to the retail dealers in Portland Town, already referred to as among those obtaining milk under somewhat similar circumstances, though more regularly, from X¹ business. For convenience of reference most of the above facts are expressed in a tabular manner in the footnote.[1]

Now the milk supply of the circle within which occurred the greatest prevalence of throat illness, the "inner circle" of this Report, has been tolerably exactly ascertained, and for present purposes may be stated as follows:—

Households supplied by Mr. A	236	=2,700
,, ,, Mr. B	237	
,, ,, other milkmen (including Messrs. M, *c*, *d*, *e*, *&c.*)	2,227	

So that of the total milk supply of the inner circle about one-fifth was from two retail dealers distributing the bulk of the milk from the X¹ wholesale business.

On the above several groups of milk consumers the incidence of throat illness, taken to mid-June, when the outburst as such ceased, was extremely unequal. This will be apparent from the following figures:—

Of 236 households supplied by Mr. A, 37 were invaded, or	156 per 1,000	143 per 1,000
Of 237 ,, ,, Mr. B, 31 were invaded, or	130 per 1,000	
Of 2,227 ,, ,, other milkmen, 30 were invaded, or		13 ,,

A difference of incidence, namely, in proportion of 11 to 1 between the two sets of customers.

On investigating the relation of throat illness and milk supply in the outer ring similar evidence was forthcoming. The milk supply of this area, though not exactly ascertained, may be taken to have been as follows:—

Households supplied by Mr. A or B . . .	some	100	= 2,700
,, ,, other milkmen . .	,,	2,600	

Here the incidence of throat illness on the two groups was 6 and 14; or 60 and 5 per 1,000 respectively; a difference namely of 12 to 1.

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[1] SCHEME OF MR. X'S MILK DISTRIBUTION.

Milk Supply derived from—

Dairy X¹ (yield about 80 gallons).		Dairy X² (yield about 54 gallons).	
By Mr. A	47	By Mr. M	9
,, B	24	,, N	19
By Messrs. *c*, ,, *d*, ,, *e*, ,, *&c.*	?	,, O	10
		,, P	2½
		,, Q	13

The figures refer to barn gallons daily.

A, B, *c*, *d*, *e*, M, N, O, P, Q, indicate retailers, of whom, among those supplied from dairy X¹, *c*, *d*, *e*, *&c.* took only such balance of milk as remained after A and B had been supplied. Mr. A derived his whole supply from Mr. X; the others part only of their supply.

With reference to the evidence implicating the milk services of Messrs. A. and B, and in view also of the fact that the places of business of these tradesmen were so situated within the inner circle as to tend very much to restrict their milk services to the special sewage areas, it seemed desirable to examine, in a manner similar to that above adopted, the relation of throat illness and milk service within the special sewage area itself. This being done, gave :—

Households supplied by Mr. A or B	430	= 2,300
,, ,, other milkmen	1,870	

Thus Messrs. A and B furnished less than a quarter, and other milkmen more than three quarters of the total milk supply of this area.

And the incidence of throat illness on these two groups was—

Of 430 households supplied by Messrs. A and B, 64 were invaded, or 148 per 1,000.
,, 1870 ,, ,, other milkmen 22 ,, 11 ,,

or a difference of 13 to 1. So that in this special sewage area, where milk consumers of both sorts were alike exposed to the same influence of sewers, we have an equality of incidence of throat illness on the two groups of customers even greater than that observed in regard of similar groups in the inner circle and in the outer ring.

There is now seen in the facts of the milk supply of the special sewage area a reason, apart from any question of sewer circumstances, for the special incidence of throat illness therein observed.

On proceeding to examine the incidence of the throat illness as regards age, some further facts not inconsistent with milk causation of the outbreak are obtained. These are given in the following table :—

Facts as to Age of 233 (out of the 264) Cases of Throat Illness investigated in Kilburn and St. John's Wood.

All ages . .	233	
0—1 . .	2,	or 0·8 per cent. of 233.
1—3 . .	21,	,, 9·0 ,, ,, ,,
3—12 . .	124,	,, 53·2 ,, ,, ,,
12—20 . .	31,	,, 13·4 ,, ,, ,,
20 + . .	55,	,, 23·6 ,, ,, ,,

It is thus seen that children, notably children at ages 3—12 years, have especially suffered from throat illness. And some such incidence might have been anticipated in an outbreak due to milk causation ; or children, as essentially the milk drinkers in their families, would under such circumstances be especially prone to suffer infection. But the facts respecting age incidence here observed must not be regarded as necessarily significant of infected milk. In other outbreaks of diphtheria, where milk has not come into question, children at ages 3—12 years have especially suffered, while infants under 3 and persons over 12 years have suffered proportionally very slightly.

It becomes necessary now to investigate the relation as regards time between the incidence of throat illness and milk service. This may be dealt with by classing together the areas hitherto considered separately, and by contrasting the time incidence of the disease on households supplied by retailers other than A or

B with that affecting customers of these tradesmen, which has been done in the following tables ;—

SHOWING the NUMBER of HOUSEHOLDS invaded Week by Week in each GROUP referred to.

	March 9.	March 16.	March 23.	March 30.	April 6.	April 13.	April 20.	April 27.	May 4.	May 11.	May 18.	May 25.	June 1.	June 8.	June 15.
Households supplied by retailers other than Mr. A. or Mr. B.	1	5	2	5	2	2	1	2	4	1	6	4	5	2	2
Households supplied by Messrs A. or B. only	1	—	—	—	—	—	1	4	6	6	40	11	3	1	1

SHOWING the RATES OF INVASION per 1,000 HOUSEHOLDS in each GROUP referred to.

	March 9.	March 16.	March 23.	March 30.	April 6.	April 13.	April 20.	April 27.	May 4.	May 11.	May 18.	May 25.	June 1.	June 8.	June 15.
Households supplied by retailers other than Mr. A. or Mr. B.	·2	1·0	·4	1·0	·4	·4	·2	·4	·8	·2	1·2	·8	1·0	·4	·4
Households supplied by Messrs. A. or B. only . . .	1·7	·0	·0	·0	·0	·0	1·7	7·0	10·5	10·5	70·1	9·2	5·2	1·7	1·7

It thus appears that not only have customers of Messrs. A and B suffered, as has been already ascertained, relatively and actually in excess of other people, but that these persons have borne almost the whole brunt of that outburst of throat illness which first attracted attention to the district, and which has been locally referred to sewer causation. From almost complete immunity during the five weeks ending April 13, customers of Messrs. A and B commenced to suffer in rapidly increasing ratio until in mid-May they were invaded in one week at a rate of 70 per 1,000 households ; after that date their rate of attack declined even more rapidly than it had arisen and by mid-June had become almost nil. It will be observed, however, that apart from the throat illness affecting customers of Messrs. A and B, there was throat illness in the area under consideration before, during, and after the outburst referred to. Hence whatever may have been the influence of Messrs. A and B's milk in the causation of the outburst, such milk cannot be credited with all the mischief which has occurred, especially, it must be acquitted of the introduction and early maintenance of the disease in the district.

This other throat illness in the district during the period under investigation affected 44 households ; 17 of which obtained their milk from retailers (other than Mr. A or Mr. B) supplied in part by Mr. X, and 27 from wholly different sources. Further, of the households supplied by retailers who had relations with Mr. X, 13 obtained their milk from Mr. M, who derived part of his tot milk not from the X^1 business at Kilburn, but from the X^2 business at Muswell Hill. The facts are as follows :—

Households obtaining Milk from		Period antecedent to Main Outburst.									Period Corresponding to Main Outburst.							
		March 9.	March 16.	March 23.	March 30	April 6.	April 13.	April 20.	April 27.	Households invaded in Period.	May 4.	May 11.	May 18.	May 25.	June 1.	June 8.	June 15.	Households invaded in Period.
X sources	Messrs *c. d, e, &c.* (X^1 business)...	—	—	—	—	—	—	—	1	1	—	—	1	1	1	—	—	3
	Mr. M. (X^2 business)...	1	2	1	4	2	1	—	1	12	1	—	—	—	—	—	—	1
Sources other than X. ...		—	3	1	1	—	1	1	—	7	3	1	5	3	4	2	2	20
Totals...		1	5	2	5	2	2	1	2	20	4	1	6	4	5	2	2	24

It thus appears that during the period corresponding to the great outburst, the incidence of this other throat illness has fallen mainly on households not having Mr. X's milk, and but little on customers of retailers furnishing that milk. This incidence may or may not have arisen from indigenous diphtheria, or from increased facilities afforded at this time for direct personal contagion from the large prevalence of the disease among customers of Messrs. A and B ; or it may, some of it, there is ground for believing, have been due to members of invaded households having exceptionally partaken of X^1 milk away from their own homes. However the other throat illness of the period in question be accounted for is of no great importance, seeing that the connection at this very time of Messrs. A and B's milk with the great outburst of the disease has been fully established. But in regard of the period antecedent to the outburst, the cause of the throat illness is important. Herein occurred the beginning of undue prevalence of the disease in the district, and its exceptional incidence on customers of Mr. M needs, therefore, explanation.

Mr. Power, in this connection, then proceeds to advert to Mr. X.'s Muswell Hill business. Muswell Hill milk, within the area hitherto dealt with, was retailed only by Mr. M., and though not connected with the great outburst therein of throat illness, was nevertheless associated, in regard of Mr. M.'s customers, with a large amount of throat illness in the district which preceded the great outburst among cutstomers of retailers supplied with milk from the Kilburn business. A suspicion was thus raised whether Muswell Hill milk may not, like Kilburn milk, have been causative of throat illness, though operating in a different manner; and further, whether it may not have been concerned in the inception and early maintenance of the disease in the district in question. Although Mr. M.'s business is as large and his customers as numerous as Mr. A.'s or Mr. B.'s, the amount of milk received by him from Mr. X.'s Muswell Hill business has been small, nine barn gallons daily only. This milk was distributed generally over the infected area, and the throat illness associated with this milk service was not confined to any part of the district, but households invaded were distributed over the whole area of his supply. The suspicion thus raised derived support from the facts ascertained with regard to other retailers obtaining milk from the Muswell Hill business. A detailed inquiry into the occurrence of throat-illness in two suburban neighbourhoods, in one of which nineteen, and in the other ten gallons of Muswell Hill milk were distributed daily, elicited facts, which Mr. Power gives in detail, of a like incidence of throat illness upon families using the milk as had been observed in the infected area in North London. On this Mr. Power observes:—

> The very similar incidence of throat illness on customers of retailers dealing in Mr. X's Muswell Hill milk, observed in places so distant from each other as the above, and separated, some of them, by tracts of inhabited districts in which no diphtheria was heard of, affords, I am disposed to think, strong corroborative evidence of the conclusion drawn from study of throat illness associated with the milk services of Messrs M. and N., viz., that the milk supplied to retailers by Mr. X, from his Muswell Hill business, was in March and April an essential factor in the causation of the disease. Now it has been already shown that milk supplied to retailers (Messrs. A, B, *c*, *d*, *e*, *etc.*) by Mr. X from his Kilburn business, was in May and June similarly, though much more seriously, effective in producing throat illness. Hence it would seem that there has been at Mr. X's Muswell Hill business an influence causative of milk infection beginning to be operative in March, and ceasing to be so in April; while there has been at his Kilburn business an influence potent for the same result, though more intense in its effects, commencing in April and ceasing to be operative in June.
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> Such is the story of the outbreak, and its main facts may be summed up thus: (1) Mr. X's milk, whether from Muswell Hill or from Kilburn, and in whatever locality distributed, has conveyed to customers of retailers distributing it throat illness. (2) In regard of each business (Muswell Hill or Kilburn) the above relation of milk service to throat illness was observed for a limited period only, that period beginning for one business only about the time that it ceased for the other.

Mr. Power failed to obtain the slightest clue to the mode in which the milk had been contaminated, and it is not improbable, as he suggests, that his failure was in part due to the complexity of the conditions requiring investigation, and to the lapse of time between the operation of the cause of the throat illness and the date of commencement of the inquiry (the report is dated 10th December, 1878).

The official report concludes with presenting the negative evidence which Mr. Power collected on the way in which the milk might have become infected; but elsewhere he has offered some speculative suggestions on the subject of great interest. In a paper communicated to the Pathological Society he has assumed that this evidence may be taken as excluding infection of the milk from human sources, and has raised the question whether it may not have been derived from some as yet unrecognised disease of milk-kine. The only marked ailment affecting any of the cows which yielded the infected milk that was ascertained, was the localised mammitis, commonly known as *garget*, and ordinarily regarded as a quite trivial affection. As a starting-point for inquiry, Mr. Power asks whether under this name more than one form of disease may not exist, and whether there may not be some infectious form bearing upon the question. Singularly enough a short time before Mr. Power submitted this matter to the Pathological Society, veterinarians had discovered an infectious form of garget, and this discovery can scarcely fail to give impetus to the line of investigation suggested by Mr. Power with reference to the diphtheria. The question is now under consideration of a committee of the Pathological Society.

While the possible relation of some undetermined malady of milk-kine to milk seemingly capable of conveying the infection of diphtheria to man was under consideration here, Dr. Nicati, of Marseille, was considering a possible relationship of the prevalence of diphtheria among fowls to diphtheria in the human species.[1] M. Gavard, a veterinary surgeon, had brought under his attention an outbreak of diphtheria occurring among the poultry of one of his clients. The diphtheritic character of the malady appeared to be quite clear to Dr. Nicati, who examined the affected animals, and he endeavoured to ascertain whether there was any relation between the malady and diphtheria as observed in man. The researches he made with a view of throwing light on the question for the most part gave negative results, but he ascertained the inoculability of the diphtheritic disease among the poultry to other kinds of animals;

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[1] *Revue d'Hygiène et de Police Sanitaire.* No. 3, Mars 1879, p. 237.

and that the outbreak in the poultry-house coincided with a recrudescence of diphtheria among the population of the city. A subsequent outbreak of diphtheria among poultry and pigeons in a suburb of Marseille, contemporaneously with prevalence of diphtheria among the inhabitants of the city, gave Dr. Nicati further opportunity of studying the question at issue, and he observes: "This coincidence between the diphtheria of poultry and that of the human species, the analogy in the clinical characters of the two diseases, and the inoculability of the diseases by means of the false membranes, render their identity more and more probable. I have believed it my duty to bring these facts under the consideration of our departmental commission of hygiene, with a view to their adoption of the following measures, namely, (1) a severe inspection of poultry at the time of being brought into the city; (2) an investigation to discover the foci of the disease in order that measures may be taken for their extinction."

M. PASTEUR ON THE OBSERVATION OF PLAGUE.

The discussion on the observation of plague which occurred in the French Academy of Medicine, on the 4th ultimo, was of considerable interest, an interest chiefly due to the fact that M. Pasteur took part in it. The discussion arose on a paper which had been read at the previous meeting by M. Fauvel on the recent outbreak of plague in Astrakhan, and it was opened by M. Marey. He was desirous to ascertain what instructions had been given to the different medical delegates who were then hastening from various European countries to the seat of the outbreak. Nowadays, he said, these epidemic maladies had to be approached from a new standpoint. Miasm has become embodied, and M. Bouillaud lately expressed his admiration of those modern researches which assigned to bacteria and vibrions so important a part in the development of transmissible maladies. All are not yet of accord on this subject; yet those who accept the germ theory stand on better ground in respect to possibilities of prevention of epidemic diseases than those who have recourse for their explanation to something undefinable, to a *quid divinum*. Appealing to MM. Pasteur, Davaine, and Bouley, M. Marey expressed the opinion that they would find no difficulty in formulating a programme for the methodic study not only of plague, but of epidemics generally, and a series of hygienic and prophylactic prescriptions with regard to them. M. Zuber, who has been despatched by France to the seat of plague in Russia, would no doubt be glad to receive the counsels of competent men on the subject of his difficult work. M. Bouillaud followed M. Marey, and repeated what he had previously said before the Academy of Sciences, that with regard to the questions of the nature and contagion of plague, as of other maladies, the recent researches of M. Pasteur had profoundedly changed the face of things. Approving of the measures which had been taken in Russia and elsewhere to prevent the extension of the disease, he was of opinion that the occasion should not be neglected for studying by all the means in our power the agent of plague, its origin, and its mode of communication or transmission. How shall we proceed with any hope of success, he asked, to a determination of the prophylactic and curative measures to be taken against a pestilence of which we do not know either the origin, or the nature, or, if I may say so, the *place of birth*, or the *body*, or the *principle of action?* He would also appeal to M. Pasteur for knowledge of the programme of research he would trace had he to investigate and treat an outbreak of plague. M. Fauvel, the medical adviser of the French Government in such matters, then rose, and, in answer to M. Marey, stated that the French delegate to Russia had been instructed in the sense that had been suggested by that gentleman. He added that it seemed to him to be the more needful to proceed to precise researches upon the origin and prophylaxis of plague, as we are in profound ignorance of the essential characters of the disease; and that except by destruction by fire, or at least the use of high degrees of heat, we do not possess trustworthy means of disinfection, or, in other words, means of destroying the morbific germs. M. Pasteur then followed, and said: I had resolved never to address this Academy except when I could submit to it positive, demonstrable facts. I crave pardon, then, if, moved by the observations of M. Marey, I attempt to speak on a subject of which I am ignorant. My excuse is that I am one of those individuals who believe in the germ theory as relates to contagious maladies. I believe in it because, having studied several of these maladies, I have obtained indisputable proof that they depend exclusively upon the presence and development of microscopic organisms. Naturally, therefore, I have certain views in regard to plague and the *desiderata* of its study, which I now venture to communicate to the Academy.

If I were called upon to study plague in a locality where the disease was present, I should assume first (because at the commencement of every investigation it is necessary to have a preconceived idea to guide us) that plague is due to the presence and development in man of a microphyte or microzoaire. Starting from this view-point, I should devote myself exclusively to the culture of the blood and of various humours of the body, blood or humours being taken towards the close of life or immediately after death, in the end and with the hope of isolating and purifying the infectious organism, and especially with a view of obtaining it in a medium of culture disengaged from all association whatsoever with products known or unknown, living or dead, that the most fruitful imagination could suppose to exist in its company in the fertilising droplet of the first culture. The analysis of the air of infected places, the chemical analysis of the blood of the sick, the microscopic analysis even of the blood, avail nothing for obtaining a precise knowledge of the properties of an infectious organism. Although it would be an error not to study microscopically with the greatest attention morbid products, it is necessary not to attach too great a value to this sort of examination, because very many circumstances may give rise in the body of a plague patient, dying or dead, to microscopic organisms. They may, moreover, exist there without the microscope discovering them. Moreover, by the side of these organisms of which we know not the properties, many pathogenic products and hidden causes of death may exist. In the actual state of science, the proof that a microscopic organism is, by its development, a cause of death, cannot be decisive except on condition that this organism has undergone successive cultures, indefinitely repeated in liquids themselves inert; and that these liquids invariably show the same development, the same appearance of life, associated with the same virulence, as shown by the production of disease and death by their inoculation.

How is this virulence to be proved? It is easy when the question refers to the contagious diseases of animals. In the case of plague it would be requisite to inoculate animals of divers species, preferably monkeys.

It is necessary to undertake these difficult studies with a mind free from prejudice. They ought to be undertaken in the same methodical manner that a chemist delivers himself to the analysis of a mineral. To this end it is well to believe that the contagions and infections are neither so common nor so ready of transmission as might be imagined if their sudden and mysterious appearance were alone considered. So far as I am concerned I should proceed to the study of plague, when the disease is endemic, without fear, on condition of taking the following precautions, and even these are probably exaggerated. I would wear spectacles furnished with cotton-wool between their borders and the skin of the face; I would cover the mouth and the nose also with cotton-wool; I would re-heat myself all my food; as drink I would take solely natural mineral waters or waters collected from their sources, or which had passed through several metres thickness of soil. Under these circumstances the purity of the water is always irreproachable, as I demonstrated several years ago in a work prepared in conjunction with M. Joubert. But any water may be used which has been subjected to a temperature of 110° to 120° C. and, when cold, shaken for a minute or two in contact with pure air in order to aërate it.

Here is a fact which confirms what I say of the slight danger which attaches to the study, even assiduously, of contagious and infectious maladies. For about three years anthrax and septicæmia have been often studied in my laboratory. Not only have no accidents occurred to the persons engaged in the studies, but there has not been a single spontaneous death among the animals used for experiment. They are all kept more or less together in the same place, each in a special cage, its own residence, so to speak. Not a single hare, or guinea-pig, or sheep, or even fowl has been infected by a neighbour of the same or of a different species. For several months a third infectious malady has been studied in the same laboratory. This malady is described in veterinary medicine as the "epizootic of the poultry-yard" (*malade epizootique des basses cours*), and sometimes "fowl-cholera" (*choléra des poules*). It is a terrible malady in its effects, contagious and infectious, capable of destroying in a few days the poultry of a farm. Thanks to M. Toussaint, the very able professor of the veterinary school of Toulouse, who sent to me in the month of December some blood of a young cock which had died of this disease, and in which he had distinguished a microscopic organism that he found also in all the animals he had inoculated with it, I have been able, aided by M. Chamberland and a young physician, M. Roux, to extract and cultivate in a state of purity the microscopic organism, the cause of the disease, and to demonstrate by the method of successive cultures, to which I have refered, that this organism, by its facile development in the body of animals of the poultry-yard, is the sole and indisputable cause of the malady. The fowls used for the experiments are placed in cages above each other, but an instance of spontaneous infection has never happened. Nevertheless nothing would be easier than to bring abont mortality from this source. You have recently heard M. Davaine relate that in a place where many animals were brought together, some septic and some not, instances of infection occurred.

The three maladies of which I speak, anthrax (*charbon*) putridity of blood (*septicæmia*), and fowl-cholera, exist in the state of germs bottled in my laboratory. At will, during the last two years for the two first, and for several months for the third, these germs, always ready, can be poured out for new inoculations and new deaths.

Suppose for a moment that these germs were transported to a village on the right bank of the Volga, into the midst of crowded populations and unwholesome dwellings, such as M. Fauvel described to us on Tuesday last, and that by a puncture or otherwise these diseases should explode, do you imagine that matters would proceed as in my laboratory? No. A first patient would communicate the disease to his neighbours or his relatives, and you would presently witness all the effects and all the terror of anthrax and of septicæmia among men or among animals, and an epidemic of animals of the poultry-yard. There are no epidemic media [*milieux épidemiques* = epidemic constitutions]. That which to me corresponds to this term—as I have proved demonstratively for the pébrine of silkworms—is a greater or less abundance of the germs of the disease. As regards prophylaxis, a knowledge of the properties of infectious microbia suggests more or less easily preventive means.

M. Pasteur terminated his observations by referring to a question of arresting the mortality among the poultry in a farmyard then under his consideration, but without going into details of the means he would recommend either for fowl-cholera, or anthrax, or septicæmia, to both of which latter maladies he also referred in this connection.

M. Jules Rochard followed M. Pasteur, and pointed out that the sort of inquiries as to plague suggested by the last-named gentleman would be difficult of pursuit, if not impossible, under the conditions in which plague had to be studied on the Volga; and that of necessity almost all our studies there must be clinical and pathological, such as could be compassed by the aid of a thermometer, a microscope, and a box of reagents which may be carried about by the physician. As to the general precautions suggested by M. Pasteur, he condemned them as utterly inconsistent with the sort of work required from the physician, and as much out of place and as needless in plague, as they would be in typhus, in small-pox, and in yellow fever.

THE PRACTITIONER.

MAY, 1879.

Original Communications.

ON IODOFORM.

BY ALFRED SHEEN, M.D.,

Surgeon to the Glamorganshire and Monmouthshire Infirmary.

IODOFORM has been known for many years, but it is only recently that its use has been brought prominently before the profession. So impressed am I with its real value in certain cases, as an external application, that I have added it to my list of remedies that may be fully and faithfully relied on when wanted. It is a bright yellow crystalline body, with an extremely pungent and penetrating odour, and in composition it is an analogue of chloroform ($CHCl_3$), the three atoms of chloroform being replaced by three atoms of iodine.

The use of this substance was advocated by Mr. Berkley Hill in a short paper which appeared in the *British Medical Journal* on January 26, 1878; and in his *Student's Manual of Venereal Diseases*, published recently, he says: "All chancres are best treated with iodoform: under its use healthy sores heal rapidly, creeping sores generally cease to spread, and sluggish ones take on healthy action." My own experience supports this statement most fully. I cannot explain the manner in which it acts, but that it does have a most remarkable effect in promoting the healing, not only of ordinary chancres, but of many other sores, I can have no possible reasonable doubt. It is what I might call a *reliable* remedy, and often saves one a deal of trouble. Its effects seem almost magical. You sprinkle a little of the crystals, powdered or unpowdered, over the sore, cover this with a bit of dry lint, or vaseline spread on lint, and at your inspection next day you find that healing has progressed rapidly, the sore has filled in considerably if it is a deep one, there is but little discharge and no smell, and you have only to repeat the dressing, and so go on from day to day until healing is complete. The relief from pain is often remarkable. In illustration of these remarks I will give a few cases from my private case papers.

Case. I.—Mr. R. consulted me on January 18, 1878, suffering from a chancre, involving the end of the urethra and the glans for a distance of about $\frac{1}{6}$th of an inch. He lived twenty miles away, came to see me at irregular intervals, and said he could not give up his work as an accountant. The sore got rapidly worse, and eventually, on my advice, he took lodgings in town, where I could see him daily. On February 12th I had him well in hand. He was sent to bed, and as he had a roseolous rash and sore throat I put him on gr. 3 pil. hydrarg. daily, which he took till March 9th. The only local treatment he had was iodoform, applied in the way I have indicated, once or twice daily. The sore at once commenced to heal, and he was sent home on March 19th quite well. He suffered from no subjective symptoms whatever during the treatment, except when, on February 26th, black wash was substituted for the iodoform by way of experiment, which was followed by so much discharge and pain that the iodoform was again reverted to and continued to the end.

Case II.—Mr. B. consulted me, suffering for a chancre about the size of a threepenny bit on the glans. I gave him a small quantity of iodoform powder to be used morning and evening. He did not call again, but a short while after I met him accidentally, and on asking after his sore he said, "Oh, it healed up before I had used half the powder." (This is one of the disadvantages of the remedy to the general practitioner, but of course in our noble profession we take no account of that!)

CASE III.—Mr. T., a cabman, sent for me on June 15th. He was suffering from a punched-out looking sore on his leg a few inches above the ankle, and over the seat of a former compound fracture. He had great pain; there was much swelling, with bluish-red shiny surrounding skin, and altogether matters looked very unpleasant, especially as he had a new situation that he was to go to on the 17th. I managed to keep him in bed, however, till the morning of the 19th, and by the aid of rest and the constant application of Goulard's lotion got the swelling and inflammation subdued. On the morning of the 19th I sprinkled iodoform into the sore, covered it with a bit of dry lint, applied a bandage from the toes to the knee, and he went to his work. I was certainly curious to see how such an apparently unfavourable case would go on. On the 20th the dressing was reapplied; there were no subjective symptoms, the pain had been at once relieved and had not recurred, and the sore had commenced to heal; the lint was stained brownish-red, but there was no discharge. From accidental circumstances the dressing was not disturbed till the 23rd (three days), and I felt anxious about the state of the ulcer and surrounding parts, but on removing the bandage and lint I was pleased to find everything *in statu quo,* except that the ulcer had filled in considerably. The iodoform was then re-applied about every third day, and by July 10th the ulcer had healed soundly.

CASE IV.—J. W., æt. 18, consulted me on October 26th. He had had a chancre, followed by buboes above and below Poupart's ligament on the left side, attended with great pain. These buboes had suppurated, and were rapidly extending from inflammation and want of rest. On the 29th there was much sloughy discharge and great pain, and surrounding redness of skin, a large gland lying isolated in the upper part, and the whole divided into two parts by a mere strip of skin, ¼ inch wide, in a line with Poupart's ligament. He was put to bed, Goulard's lotion, with hourly syringing with warm water, were successfully used to reduce the inflammation, and on November 2nd, when the use of iodoform was commenced, the upper part of the sore measured 1½ × 1 in., the lower, 2¾ in. × 2 in., and was very deep. The effects of the iodoform were simply marvellous. All pains ceased and never recurred, the sore commenced to heal, assuming a bright red healthy appearance, and the discharge was reduced to a mere nothing, and altered in character, looking like serum and having no odour. The whole sore was soundly healed by November 30th.

At our Union Hospital iodoform has with me been the routine treatment of chancres and some other sores, and with very satisfactory results.

Any who may feel further interested in this subject I would refer to the *British Medical Journal*, vol. i. 1878, pp. 20, 127, 190, 193, 294, 367, and 710; *Practitioner*, vol. iv. p. 308, and vol. vi. p. 380, and to a paper by Dr. Moleschott of Turin, in the *Medical Record* of November, 1878. The latter speaks of its value in getting rid of glandular swellings, even such as occur in lymphoma and in splenic leukœmia, in orchitis, in effusion into serous cavities, in acute hydrocephalus, in chronic arthritis, in intercostal and other neuralgias, &c. He says that before promoting absorption it determines the destruction of the primitive elements, and that its power may be regarded as miraculous. He uses as an external application 1 to 15 parts of elastic collodion, or 1 to 15 parts of ointment, and advises that these preparations should be kept at a distance from the window, in a well-closed tin case, thus retarding the decomposition of the iodoform, which goes on rapidly in the light. When used internally he gives ¾ gr. to 1½ gr. daily in pills. He winds up his paper by saying, "That, notwithstanding its inconveniences, I dare promise for this remedy a great future." Its inconveniences are its pungent odour and its liability occasionally to cause eructations and palpitation of the heart.

ON THE ACTION AND USES OF BELLADONNA.[1]

BY J. R. GASQUET, M.B.

I HAVE undertaken to bring this subject forward for your discussion because I believe there is hardly any drug in common use of which the action is at first sight so unintelligible, both from the apparent inconsistencies, so to speak, of its own effects, and from its relation to its antagonists. Now I venture to think that recent physiological discoveries do a good deal towards clearing up these difficulties by offering a rational explanation of its action, and this in turn will have the practical advantage of suggesting new and very important fields for its employment.

In considering the action of any drug upon the nervous system, we have to remember that this may be produced either upon the peripheral nerves or upon the nervous centres. Thus bromine, arsenic, phosphorus, and (among organic substances) nicotin and physostigmin, seem to produce all their results by a direct influence upon the nerve-centres, probably by influencing their nutrition, though we are still very ignorant on this head. But in many other cases the action is obviously a peripheral one, the poison first affecting those terminal nervous branches with which it meets, and only influencing the cerebrospinal centres secondarily, if at all. This mode of action seems to be less readily accepted by the mind, though not more mysterious in itself, than the centric influence of neurotics; and I may therefore just mention the evidence for it in the case of one substance—jaborandi. If pilocarpin be injected subcutaneously, sweat at first breaks out around the puncture, and only spreads over the whole body after some time (twenty-four minutes in the case of the horse); and if this sweating be checked by atropin, it may be again locally reproduced by the hypodermic injection of pilocarpin.[1]

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[1] A Paper read before the Brighton and Sussex Medico-Chirurgical Society.

There can be, I think, no doubt that belladonna belongs to this latter class of peripheral neurotics. It dilates the pupil when applied to the frog's eye after excision; and Erlenmeyer has shown that atropin produces rapid lowering of cutaneous sensibility in the neighbourhood of its hypodermic injection, while its general effects may all be accounted for on this supposition.

These peripheral neurotics produce their varied results apparently by their acting only on some of the terminal nerves to the exclusion of others. Why there should be this selective affinity we cannot say, and probably no answer will be given until minute anatomy and physiology on the one hand, and the molecular constitution of the alkaloids on the other, have been completely studied, when a system of rational therapeutics will at last be possible. But we know that the facts are so; that ergotin acts on the vaso-constrictors, pilocarpin and muscarin on the secretory nerves, physostigmin on the iris, and digitalin on the nerves of the heart.

I may next say that I think all the effects of belladonna may be accounted for by supposing that it paralyses the peripheral nerves belonging to the cerebro-spinal system, except those supplying voluntary muscles; while it has no effect upon the nerves derived from the sympathetic.

I have already mentioned its action upon the sensory nerves, when used hypodermically; in the case of the eye, its paralysing influence upon involuntary muscular fibre is also exemplified. This is remarkable by the minute amount needed to dilate the pupil ($\frac{1}{1300000}$ grain, Donders); the dilatation of the pupil is apparently not influenced by division of the sympathetic, and is therefore due merely to paralysis of the terminal branches of the oculo-motor nerve. On the heart belladonna first has a slackening influence, which may, I suppose, be accounted for by diminished activity of the afferent nerves in the endocardium. But this is slight and transitory, and is immediately followed by acceleration and irregularity of action. This is due to arrest of the controlling influence of the vagus, which loses its inhibitory power in an animal poisoned by atropin; Böhm having shown that this is due to paralysis of its terminal branches. The blood-pressure is not increased, for the vaso-constrictor nerves are at the same time paralysed, and the arterioles dilated, to which the exanthem sometimes observed in belladonna poisoning seems to be due. The muscular fibres in the intestinal canal, bladder, ureters, and uterus, are also affected; but it has no influence on the voluntary muscles. This remarkable selective affinity is the exact opposite of that belonging to curarin, which completely paralyses all the voluntary muscles, while it has little effect upon unstriped fibre.

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[1] Luchsinger, *Pflüger's Archiv*, xv. p. 482.

The arrested secretion of the salivary and sudoriparous glands is at first sight more difficult to explain, but is apparently due to paralysis of the terminal branches of the cerebro-spinal nerves in the glands. Heidenhain has recently inferred from his experiments[1] that the secretory nerves in the salivary glands are derived from the cerebro-spinal centres, while the sympathetic nerves are simply trophic; and it seems to be established by Vulpian[2] and others that the sweat is secreted under the influence of the cerebro-spinal nerves. It is therefore consistent with what we have otherwise learned to suppose that belladonna paralyses the terminal secretory nerves, and so arrests both sweat and saliva.

I have occupied so much time with this sketch of the action of belladonna that I must pass more briefly over its uses.

1. It relieves pain, sometimes very considerably; and I think it will be found that this is usually of local and peripheral, not central, origin. Thus it is often useful in toothache (less markedly, however, than gelsemin), and in rheumatic or gouty pain; while it has no effect, so far as I know, upon the neuralgias of hysteria or other centric affections. Perhaps its effect upon epilepsy is due to its arresting the centripetal stimulus producing the fit. Whether this be so or not, I am inclined to think it has been too much neglected since the use of the bromides; and that, sometimes at least, it has an effect when these fail; it may also be advantageously combined with them.

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[1] *Pflüger's Archiv*, xvii.

[2] *Comptes Rendus*, August and September, 1878.

2. Belladonna relaxes spasm of the involuntary muscles. Its effects on the eye belong to a subject which is too special for me to handle; its power of dilating the os uteri, and relieving tenesmus of the bladder and rectum when applied locally, is equally important, but perhaps less well known. A further example of this mode of its action is its influence on constipation, which Trousseau first made prominently known. This action upon involuntary muscles is frequently increased by the anæsthetic effect simultaneously exercised by belladonna upon the afferent branches of nerves which originate spasm, as in the cases of whooping-cough and spermatorrhœa; in this latter condition I have found it on the whole more reliable than the bromides.

3. The power of checking sweat is sometimes very valuable. Dr. Fothergill has recently insisted very strongly upon the value of belladonna, as enabling us to arrest the exhausting sweats of phthisis, and I am quite satisfied that, as a rule, this is beneficial. My own very limited experience, however, leads me to doubt whether it is always an unmixed good to check the sweating of phthisical patients, at any rate when the pyrexia is high and the perspiration seems to be of service in reducing temperature.

I have repeatedly tested the efficacy of belladonna in checking the abundant salivation to which some lunatics are subject, and have always found it act with great rapidity. Its arresting the secretion of milk,[1] and the collection of pus in an abscess, are instances of the same kind.

4. I now come to the power which belladonna has of arresting inhibitory action. In medicinal doses it sets the heart free from the controlling action of the vagus, without any other effect upon its innervation. It may, therefore, to some extent replace or assist digitalis, and may be preferred, if we do not desire to act upon the muscular structure of the heart, or to increase the blood-pressure by contracting the arterioles. It seems to be particularly indicated in cases of pure inhibition, and under this head I venture to recommend its trial in the following conditions:—In collapse from shock it seems likely to be very

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[1] I have had no personal experience of this effect of belladonna, but considerable doubt was thrown upon it in the course of the discussion which followed.

useful, and has been recently strongly recommended by an American physician.[1] It would probably be equally successful when the heart's action fails from sun-stroke, or, on the other hand, from exposure to intense cold. So far as I know, no explanation has yet been suggested for those fatal cases of scarlatina, small-pox, and other infectious diseases in which the patient is, as it were, knocked down at once, and dies speedily, often before the rash has appeared. I cannot go into the reasons which lead me to think that here too we have to do with an instance of collapse from shock; if so, belladonna, or the hypodermic use of atropin, is well worth a trial, and may succeed where all else has failed. Dr. Harley urged its use in the adynamic stage of the infectious fevers, finding it then act as a powerful stimulant; here, also, I suppose it would set the heart's action free. I can less readily understand how it should speedily relieve acute local inflammations, as Dr. Phillips asserts of tonsillitis and meningitis.

There is another important therapeutical property of belladonna, which is probably due to its checking inhibitory action; I mean its power of neutralising some of the effects of opium. Without discussing the whole question of the antagonism of these two drugs, I may mention the following cases in which it is useful:—When added to a hypodermic injection of morphia, it often prevents the nausea and vomiting which this may produce; and when given with an opiate in phthisis, it not merely prevents sweating, but appears to keep up the activity of the lungs and heart.

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[1] Dr. Weber, *Philadelphia Medical Times*, February 2, 1878.

CHRONIC BRONCHITIS.

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(*Continued from* p. 265.)

Chronic Bronchitis following Valvular Lesion of the Heart.

The interference which any valvular lesion of the heart produces in the circulation of the blood, gives rise to more or less regurgitant pressure in every organ. Mitral regurgitation will naturally be that which will more directly affect the lungs, but any valvular incompetency sooner or later comes to cause some amount of obstruction to the blood circulating through them, and induces certain well-marked bronchial and pulmonary symptoms. The subjects of such valvular lesions are constantly liable to attacks of bronchitis accompanied by slight hæmoptysis, and we shall now proceed to examine the condition of the bronchi in such cases, and to indicate what the cause of the bronchial catarrhal attacks is.

When the bronchi are laid open, the most striking feature is the intense congestion and deep cyanotic tint of the mucous membrane. It is covered with more or less mucus, and, when the smaller bronchi are squeezed, a quantity of frothy serous fluid and mucus exudes.

The lung substance is also intensely congested, and numbers of punctiform hæmorrhages can be noticed between the superficial and deep layers of the pleura. All throughout the lung there are ill-defined indurated patches, of a brownish-red colour, the so-called "brown induration." If these be squeezed, they will be found to contain much less serous fluid than the surrounding lung-substance, and to be hard, comparatively non-vesicular, and somewhat dry. Their border is not at all well marked. It seems to lose itself insensibly in the surrounding lung substance. At the same time there are frequently several wedge-shaped hæmorrhagic infarctions towards the periphery of the lung. They are usually red in colour, becoming yellow as they grow older. Their base is placed towards the pleura; the border is extremely sharply defined; they are hard and non-vesicular, and sink in water. Pleurisy is generally present to a small extent, but inflammatory affections of the pleura are by no means characteristic of this lesion of the lungs.

The appearance which the bronchi have in such a case is shown in Figure 29. The lumen of the bronchus may be narrowed or dilated, according to the amount of expansile pressure which has been exerted upon it and its ability or inability to withstand

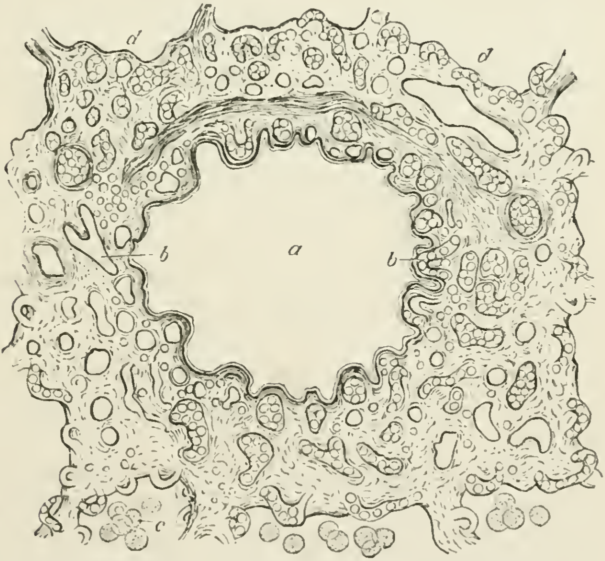

Fig. 29.—Transverse section of a bronchus, regurgitant mitral disease. × 300 Diams. *a*, bronchial lumen, with mucous membrane thrown into folds; *b*, congested capillaries; *c*, desquamated and pigmented alveolar endothelium; *d*, alveolar cavities of lung.

this. The mucous membrane is thrown into folds, apparently from the great turgescence of its capillary blood-vessels. There is usually no epithelium on its free surface, or if there is, it merely consists of small germinal buds of a transitional character. The basement membrane is thick and œdematous, and seems to take the place of the epithelium in forming a protective covering. The chief feature, however, is the extraordinary distension of the capillaries (*b*) in the bronchial wall. Every minute branch is dilated into a vessel quite easily seen with a magnifying power of fifty diameters. They are all filled with blood, which does not readily leave them when the part is cut across; and they are tortuous and varicose, pushing the basement membrane forwards into irregular folds. Rupture of a superficial branch is common, the basement membrane being torn across, and the blood escaping into the bronchial lumen. The whole of the interfibrillar spaces of the mucous membrane are widened and apparently œdematous, but small cell infiltration into them is not a marked characteristic. In this latter respect the bronchi in valvular lesion of the heart present a marked contrast to those affected with chronic bronchitis uncomplicated with cardiac insufficiency, and commencing as an acute attack.

In both cases the bronchial wall is thickened; in the former, however, it is due mainly to capillary distension and œdema of the fibrous tissue, while in the latter it owes its origin in great part to cellular infiltration. This capillary dilatation not only affects the bronchial wall, but extends to that of the alveolar cavities. In Figure 29 the distended capillaries on the alveolar wall are represented at *d*, and it will be noticed that they are not only distended, but tortuous and congested, and project into the alveolar cavity. Lying within the alveolar cavities there are numbers of large round brown pigmented cells (Fig. 29, *c*), which can frequently be seen in process of desquamation from the alveolar wall. They undoubtedly represent young and germinal alveolar endothelium, which has been cast off before it has reached maturity; and the pigment which they contain is blood pigment derived from small hæmorrhages and effused blood-serum. Every here and there groups of three or four air-vesicles can be seen filled with blood, and these, along with the desquamated endothelium and capillary distension, give rise to the patches of "brown induration." The mucous glands of the bronchi are usually distended with œdematous fluid and mucus, and their epithelium is more or less in a state of disintegration.

We would therefore say that the cause of the chronic bronchial irritation is a mechanical one, namely, regurgitant blood-pressure, producing a varicose ectasy of the bronchial capillaries, and that the lesion of the bronchi is not a true bronchitis. The surface of the mucous membrane is from its œdema unsuited for the growth of epithelium, which, accordingly, is usually absent, and hence we do not find that there is the same amount of cellular structures in the expectoration as in ordinary bronchitis.

The greater part of the secretion is composed of mucin and serous fluid, and the sources of each of these are respectively the mucous glands and the general surface of the mucous membrane. The cause of the desquamation of the alveolar endothelium is, as has been shown by Buhl (*Lungenentzündung, Tuberkulose, und Schwindsucht*), merely mechanical, and due to the œdema of the alveolar wall and loosening of the endothelial cells. These cells, while yet immature, are thrown off into the alveolar cavity, where they absorb a certain amount of blood-colouring matter and become pigmented. We believe that the lesion in the bronchi is analogous to this, and is not a true bronchitis.

CHRONIC BRONCHITIS DUE TO INHALATION OF FOREIGN MATTERS.

We have had very favourable opportunities of studying the effects of inhaled foreign bodies on the bronchi in the appearances presented in the coal-miner's lung. Bronchitis, quite apart from the disease known as "black spit," is extremely common in coal-miners in middle and old age, and, curiously enough, the secretion they expectorate is yellow, muco-purulent and not pigmented, even although, after death, the lungs may be found to be perfectly black in colour. There is not the slightest doubt that the greater part of the material inhaled is coal-dust, the particles not only presenting the microscopic structure of coal, but even sometimes the special bands of the particular coal in which the subject of the disease may have worked. Part of it, however, seems to be carbon, especially in the lungs of old coal-miners, who have worked in mines when lamps which gave off a great deal of smoke were used, and when ventilation was not so completely carried out as it is at present. In Fig. 31 some of the commonest shapes of the inhaled particles are seen. The greater number of them are either small granule-like bodies, or they are little acicular spicules, and one can easily see how their lancinating edges might cut into a texture. We have examined the bronchi in many such cases, and have invariably found the same appearances. One of the most remarkable points revealed by microscopic examination is that the larger, middle-sized, and most of the smallest bronchi are *not pigmented.* The catarrhal discharge which is found lying within them is of the usual yellow muco-purulent character, and neither to the naked eye, nor microscopically, is there to be found any evidence of the inhaled particles making their way through the mucous mem-

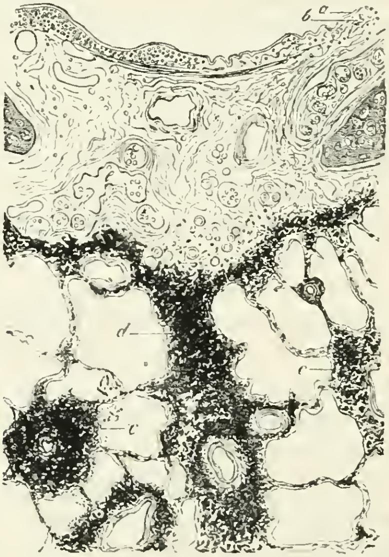

FIG. 30.—Bronchus—coal-miner's lung. × 50 Diams. *a.* Basement membrane; *b,* inner fibrous coat; *c,* pigmented nodules surrounding arteries; *d,* pigmented lobular septum; *e,* empty mucous gland.

brane of the bronchi. The whole of it seems to gain admission to the lung through the air-vesicles, infundibula, and some of the smallest sized bronchi. In Figure 30, the appearance of a bronchus, taken from a coal-miner who died from bronchitis, is represented as seen when examined with a low magnifying power. There is no proper epithelium on the surface, but the basement membrane (*a*) is very distinctly marked, while, underlying this, is the inner fibrous coat (*b*). No pigment ever seems to get through these, and the cause of this is evidently the tough character of the basement membrane. It appears to be just as impenetrable to bodies passing through it into the deeper parts of the mucosa as it is in allowing cellular structures to pass from the mucosa into the bronchial lumen. Were it not for the basement membrane, there is no reason why the particles should not have ready ingress to the deeper parts of the mucosa. The epithelium protecting it is never complete, and one would naturally expect that these sharp spicular bodies (Fig. 31) would fix upon the mucosa and make their way into it. We have invariably found, however, that the bronchi do not become pigmented until they are so much reduced in size that no basement membrane can be recognised upon them. The greater part of the pigment does not surround bronchi, but, contrary to what one might expect, it is most abundant *round the branches of the pulmonary artery*, where it accumulates in enormous masses (*c*. Fig. 30). It seems to pass very quickly from the air-vesicles to the adventitious coat of the artery, and then becomes aggregated into more or less rounded deposits. It also accumulates in large quantity *outside* the bronchus, between the outer fibrous coat and the neighbouring air-vesicles. This is represented in the Figure 30, but, as will be noticed, it undoubtedly does not reach this situation through the mucous membrane, as the latter is quite devoid of pigment, but apparently passes into it from the walls of the air-vesicles. Another situation in which intense pigmentation is to be seen is in the lobular septa (Fig. 30), where the inhaled dust forms a deposit most intense on each side. The deeper layer of the pleura is always pigmented to a high degree, but we have never seen in the superficial layer any pigment other than what may have accidentally got there in preparing the section. It is always clear and fibrous, while the deeper layer is so distended with black particles, that its fibres can be with difficulty recognised. The parts which become pigmented, therefore, in spurious melanosis, are the air-vesicles, the adventitious coat of the arteries, the lobular septa, the deep layer of the pleura, the outer part of the adventitious coat of the bronchus, and, ultimately, the bronchial glands.

The course which the inhaled particles pursue is evidently the following: they first penetrate through the infundibula, air-vesicles, and smallest bronchi, and from these they are poured into certain of the peribronchial lymphatics, but mostly into the large perivascular branches. Those which enter the peribronchial lymphatics apparently very soon pass into the larger lymphatics round the arteries. From the perivascular lymphatics they run into the lobular septa, from this to the deeper layer of the pleura, and, finally, into the bronchial glands. The nodules which are to be seen with the naked eye are due to pigment accumulation round small branches of the pulmonary artery, and the bluish-black colour which the surface of the pleura has in contradistinction to the "coal-black" colour of the interior of the lung is owing to the superficial layer of the pleura not being pigmented. This description corresponds with the course of the lymphatic vessels in the lung as described by Klein (*Lymphatic System of the Lung*), so closely, that we are bound to conclude that the pigment, after being inhaled and taken into the lung tissue, forms a complete injection of its lymphatic system. It does not follow an irregular course, but is always found in the situations above indicated. The reason why the superficial layer of the pleura is not pigmented, is that it contains the lymphatics proper of the pleura, while the deeper layer contains lymphatic vessels which are directly continuous, by means of the lobular septa, with the large perivascular branches.

If then the bronchial mucous membrane is not pigmented, if the particles which are inhaled do not pierce into it, how does it happen that chronic bronchitis should be so common among the subjects of this class of diseases? We think that the cause will be apparent on a little consideration. In the centre of each pigment nodule (Fig. 30) there is a branch of the pulmonary artery which is more or less compressed according to the amount of pigment around it, the lumen being sometimes obliterated from this cause. There must consequently be serious interference with the blood-circulation, and hence a certain amount of œdema will result. The lymphatics of the lung are at the same time choked with the foreign matters contained within them, so as also to be obliterated or seriously obstructed, and consequently the lymphatic circulation will be abolished or much impeded. This will still more favour an œdematous condition of the interstitial fibrous tissue of the organ, especially of the loose fibrous tissue of the mucous membrane of the bronchi. As a consequence, the epithelium lining the mucous membrane will be kept in a state of constant irritation, the deeper layers germinating and usually being shed long before they have completed their full development. The immediate cause of the bronchitis is undoubtedly this epithelial germination, but the remote cause is to be sought in the impediment to the blood-vascular and lymphatic circulations from pigment deposit, inducing an œdematous state of the bronchial mucous membrane, and consequently unfitting it for the growth of a proper epithelial covering. One can therefore understand why the secretion in the bronchi of catarrhal and pigmented lungs should be of a yellow colour. The colour is given to it by the abortive epithelial (or catarrhal) cells which it contains, and these, we have seen, are not directly dependent on the pigment particles for their origin.

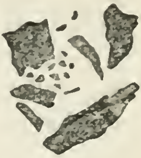

Fig. 31.—Particles from coal-miner's lung. × 480 Diams.

Bronchitis associated with Chronic Disease of the Kidney.

It is a matter of common experience that those who suffer from chronic interstitial nephritis, especially where associated with gout, are prone to intercurrent attacks of bronchitis. In our examination of such cases, where there was extreme atrophy of the kidneys, we could find nothing special in the appearances, unless apparently great hypertrophy of the muscular coat of the small arteries. The appearances, otherwise, did not seem to differ from an ordinary idiopathic case.

ON CHRONIC INTERSTITIAL PNEUMONIA AS A COMPLICATION OF BRONCHITIS.

Having described, at some length, the lesions which are produced in the bronchi as a result of bronchitis, we propose, next, to follow out some of those pulmonary affections which so frequently complicate a simple bronchial catarrh. We believe that one of the most important is chronic interstitial pneumonia, and as its description forms a fitting sequel to what has preceded, we shall now take it into consideration, and endeavour to show in what way it is associated with bronchitis. We believe that the relation between bronchitis and interstitial pneumonia has not been sufficiently dwelt upon either in a clinical or in a pathological point of view. The two frequently co-exist, and we trust to show that the former in a great many cases is to be regarded as the *raison d'être* of the latter.

The disease has been known from Lennec's time by many names, all of which we believe refer to the same morbid process, and even in modern times there still seems to be very great want of clearness in the ideas of physicians as to what the disease essentially is. We find, for instance, that in Reynolds' *System of Medicine* a disease is described by Dr. Wilson Fox as "chronic pneumonia," which seems to be essentially the same as that entitled "cirrhosis" by Dr. H. Charlton Bastian in the same work. Physicians have, moreover, dwelt upon many other pulmonary affections, and given them distinctive names, which we, looking at the matter from a pathological point of view, would include under the generic name of chronic interstitial pneumonia. The disease is an entity, but its causes are various; and in order to get any clear idea of what it is, we must look at it disassociated from its many points of origin. We have found that from whatever source it originates the morbid appearances and the essential process by which these are produced are invariably the same. It is apparently always a secondary affection, and mostly so to inflammatory processes in the bronchi and air-vesicles. It is undoubtedly inflammatory in its nature, all the changes met with in it being characteristic of those found in artificially inflamed parts. Its results are many and disastrous; and it is these, which by their great variety, and apparent incongruity, have to a certain extent, led to the confused ideas of its essential nature.

We are more particularly concerned at present with that form of it which arises from a long-continued catarrhal bronchitis; and our description of it is drawn from a series of cases in which, undoubtedly, the commencement of the disease was a bronchial catarrh, and in which, in many instances, the existence of an interstitial pneumonia was not suspected during life.

The disease, when arising from a bronchitis, is usually bilateral, and is accompanied by diminution in the volume of the chest and marked flattening under the clavicles. There is sometimes slight dulness on percussion, but this is by no means essential. It runs a very chronic course, and may be met with in childhood, youth, or old age, but oftenest in persons of middle life. It may simulate a catarrhal phthisis in the symptoms and physical signs associated with it; but in their main features the symptoms correspond more closely with those of bronchitis. The visceral and costal layers of the pleura are invariably adherent. This union is usually fibrous and inseparable; in some cases, however, the two surfaces can be torn asunder, the bond of union being apparently of a fibrinous nature. If the visceral pleura be carefully examined, several grey and gelatinous-looking nodules, of a round shape, and each about the size of a mustard seed, will be found situated in its deep layer, provided that they are not obscured by the fibrous tissue which frequently adheres to it. On being touched they move easily with the pleura, and are with difficulty destroyed by pressure. The lung is greatly shrunken in parts, and emphysematous in others, the emphysematous parts projecting from the surrounding condensed lung-tissue. It feels hard and leather-like: it has, in fact, much the consistence of a cirrhotic liver, with, of course, the exception of the vesicular character given to it by the air which it contains. The pleura is very much thickened, and, in some places almost cartilaginous in appearance and consistence. It may happen that calcification has occurred at certain parts, but this is not of so common occurrence in interstitial pneumonia arising from bronchitis as where it has been secondary to a pleuropneumonia. Considerable puckering is very frequently noticed at the apex. When the organ is incised, the thickening of the pleura can be well seen, and it can further be observed that fibrous bands, of varying thickness, and corresponding in position to the lobular septa, run inwards, and usually end by becoming attached to the wall of a cavity in the lung substance. This cavity has all the characters of one of the forms of dilated bronchi. Its shape is irregular, and it is pulled out into angular processes, so that the opposite walls may actually be in contact at certain parts. It possesses a smooth lining membrane, which has commonly some yellowish pultaceous-looking material adhering to it. One or more large bronchi communicate with it, and their mucous membrane is continuous with its lining membrane. Several fibrous bands, similar to those described above as passing inwards from the pleura, run off from this bronchiectatic cavity in different directions and lose themselves in the condensed lung tissue. The lung has lost a great part of its vesicular character, and in many large areas it seems to be so closely surrounded by the thickened pleura that expansion is impossible; while, at other parts, where the thickening of the pleura may happen to be less, an apparently compensatory ectasy of the air-vesicles has occurred. Nodules of two kinds are usually to be found in the thickened bands of fibrous tissue. The one is *grey in colour*, round in shape, gelatinous in consistence, and about the size of a mustard seed: it resembles in every particular the grey gelatinous nodules referred to above as being sometimes seen in the pleura. The other is *yellow and caseous*, with frequently an ulcerated-looking cavity in its interior. It is much larger than the other—from the size of a small pea to that of a marble—and is either round or somewhat sinuous in outline. The large nodules occur irregularly throughout the fibrous bands; the small nodules run in lines outwards towards the pleura.

Some of the compressed air-vesicles contain yellowish-looking solid contents.

Following the course of the fibrous thickenings, quantities of black pigment may be seen running towards the pleura, so that in many places the fibrous tissue has a dark grey colour.

The course which the fibrous new-formations, grey nodules, and pigment-particles uniformly take, is *towards the pleura*.

The peribronchial fibrous tissue, even where the bronchi are not converted into bronchiectatic cavities, is increased in quantity. The mucous membrane of the larger bronchi is much thickened, thrown into longitudinal folds, and deeply congested. In certain places the bronchial lumen seems to be of natural size, and in others it actually appears to be smaller than usual. Where this latter condition is present, the thickened mucous membrane will be observed to be the cause of it. The bronchi invariably contain yellow purulent-looking catarrhal fluid, and if some of this be examined microscopically, it will be found to contain catarrhal cells of different shapes and sizes, along with some columnar epithelium. The mucous membrane is red in colour, from the congestion of its blood-vessels, and always presents the smooth glossy character given to it by the basement membrane. The bronchial glands are enlarged, indurated, darkly pigmented, and frequently caseous, the caseous degeneration being often better seen in those which are within the lung than in those outside of it.

In our description of the histological structure we shall commence with the pleura, and trace the changes in the lung substance progressively inwards. A drawing is given in Fig. 32 of such a lung, from a section made through the visceral pleura (*g*), down to a bronchiectatic cavity (*a*.) The whole extent is not shown, the actual distance between the pleura and bronchiectatic cavity being about half as long again as is actually represented, the break in the figure indicating where the deficiency occurs.

At the upper part of the figure the thickened pleura is seen, torn from its attachment to the costal layer, the irregular free surface indicating the points of detachment. It still possesses two layers sufficiently well marked to be easily distinguished, and it will be noticed that both have undergone great fibrous thickening. The superficial layer (*h*) is separated from the deep layer (*g*) by a number of pigment particles, which have accumulated in the latter, but have not reached the former, an appearance which has been explained in the foregoing article on "Bronchitis due to inhalation of foreign matters." As we examine the deep layer, a thick fibrous band (*f*) can be noticed coming off from it, and passing into the lung substance; and when traced downwards it is seen to become connected to the

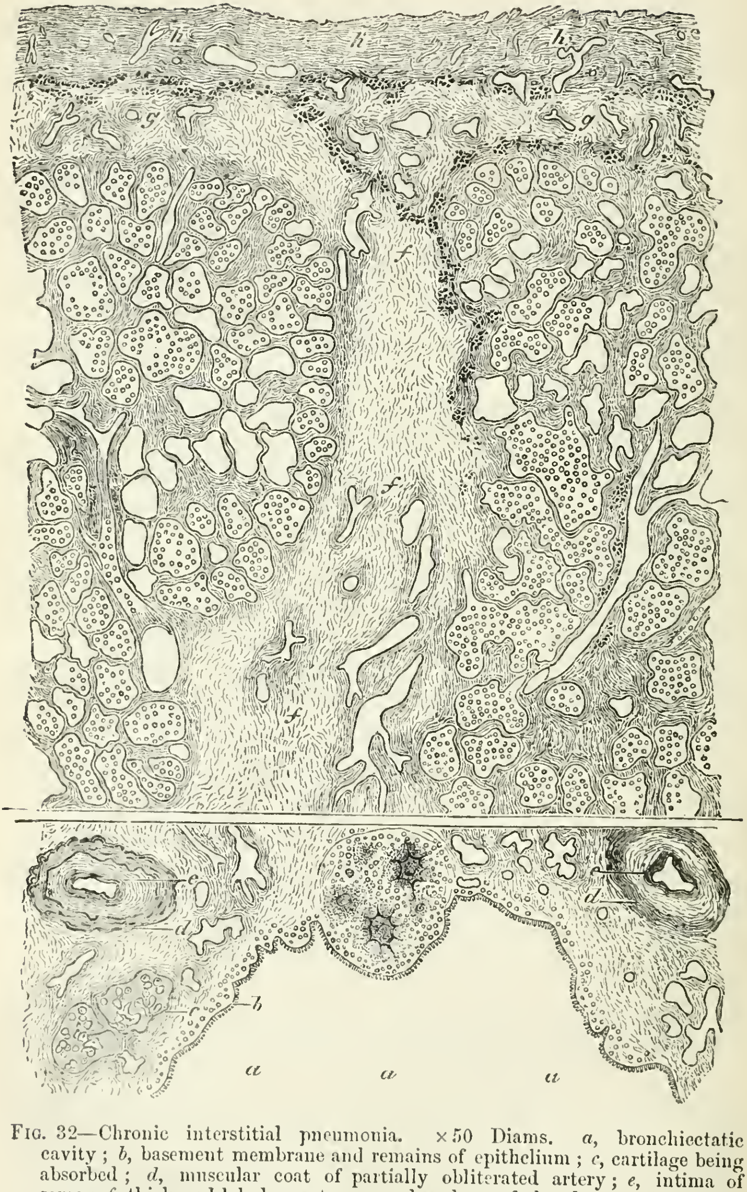

FIG. 32—Chronic interstitial pneumonia. ×50 Diams. *a*, bronchiectatic cavity; *b*, basement membrane and remains of epithelium; *c*, cartilage being absorbed; *d*, muscular coat of partially obliterated artery; *e*, intima of same; *f*, thickened lobular septum; *g*, deep layer of the pleura with pigment particles in it; *h*, superficial layer of the pleura, its adhesions torn asunder; *j*, tubercle in the bronchial wall.

large bronchiectatic cavity (*a*). It is firmly united to it, and the fibrous tissue of which it is composed spreads out so as partially to surround the bronchiectatic cavity. That this large cavity is a dilated bronchus is indisputably proved by the fact of its being lined with epithelium of a columnar type (*b*), and that this rests on a thin basement membrane. The fibrous band above described is a lobular septum, and an idea may be formed of the amount of thickening which it and the pleura have undergone by comparing the appearance it presents with that of the normal lung in Fig. 1. In the two figures the connections of the pleura, lobular septum, and bronchus are alike; their relative proportions, however, are greatly altered.

On one side of this thickened lobular septum the air-vesicles are noticed, and around some of them a certain amount of fibrous thickening is to be seen. At this part of the lung, however, the fibrous thickening round the air-vesicles is by no means so evident as it was at some others, where the latter had become totally obliterated by the abnormal pressure of the former. Two of these air-vesicles are represented in Fig. 33, in process of obliteration, the vesicular spaces being seen at *a*, while the cicatricial fibrou tissue around them is represented at *b*. The alveolar walls are enormously thickened, from fibrous new formation; the outline of the air-vesicles is irregular; and the epithelium lining them

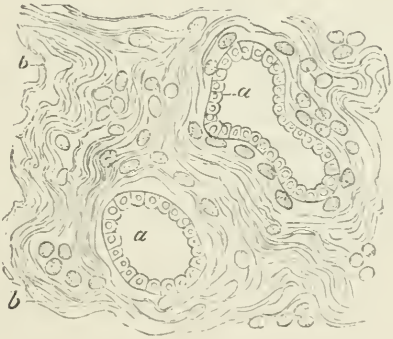

FIG. 33.—Air-vesicles in chronic interstitial pneumonia in process of obliteration. × 300 Diams. *a*, shrunken air-vesicles lined with atypical epithelium; *b*, surrounding cicatricial tissue.

has undergone a curious change, first referred to, we believe, by MM. Cornil and Ranvier (*Manuel D'Histologie Pathologique*), and evidently similar to that described by Friedländer as occurring in the pneumonia resulting from division of the recurrent nerves (Virchow's *Archiv*, vol. lxviii. p. 358). Instead of having the characters of an endothelium, that is to say a thin and delicate flat layer, it becomes cubical in shape, (Fig. 33), as to resemble the epithelium seen on the smallest sized bronchi; reverting, we believe, to its original type. Each cell has a distinct nucleus, and the layer, although the individual cells are much reduced in size, completely invests the alveolar cavity.

The histological structure of the thickened interlobular septa and alveolar walls varies according to the duration of the interstitial pneumonia. In its earliest condition the appearance represented in Fig. 21, gives an idea of what is to be seen. The flat connective tissue or endothelial cells lying on the bundles of fibres of the interlobular septa, and peribronchial and periarterial fibrous tissue, begin to germinate as previously described, and, as a result of this germination, large areas filled with small round cells are produced. These elongate, become spindle-shaped, and soon afterwards constitute a cicatricial tissue. That such cells actually form the fibres of the growing cicatricial tissue we are aware has been strongly controverted by many eminent authorities, but, notwithstanding all that has been said, we cannot help believing that in the *adult*, as a result of such an *inflammatory process*, they actually become transformed into the fibrous tissue. Besides these appearances, however, large masses of fibrinous lymph are commonly met with in the cicatricial tissue, apparently formed subsequently to these primary changes in the fibres. The same appearances are noticed in the periarterial and peribronchial fibrous tissue; and long rows of small round cells can be traced running from the latter into the thickened lobular septa, while, side by side with these, black particles of carbon are noticed.

Most of the parts which show cicatricial thickening have, as a rule, an abundant blood-vascular supply, forming in some places a dense cavernous-looking plexus. This, of course, is necessary for the nourishment and organisation of such highly protoplasmic structures, and is a condition by no means confined to the lung, but is met with in similar processes occurring in the liver and kidney. In many of the smaller arteries, however, there is a lesion, which we have always found associated with chronic interstitial pneumonia, and which perhaps might account for many anomalous appearances seen in them. It is that extremely important disease of the inner coat of the artery called "arteriitis obliterans" by Heubner and Friedländer, and which is referred to by the latter, in the article quoted above, as ensuing in the lungs of animals in which the recurrent laryngeal nerves had been divided. It is of so frequent occurrence and generally so widely spread, that we cannot help believing that it plays a most important rôle in bronchitis, whenever there is any consecutive interstitial pneumonia present. In Fig. 32 at *e* the thickened *intima* of one of the branches of the pulmonary artery is represented as seen with a low magnifying power. The thickening is uniform, and the lumen of the vessel is much reduced in size, while the elastic laminæ do not seem much altered. In Fig. 34, the same vessel is seen more highly magnified; and it will here be noticed that the thickening is entirely due to a formation of tissue, undistinguishable from an ordinary cicatricial production, in the *intima.* We have never noticed that it becomes atheromatous, in this respect differing from the ordinary, and much more common, atheromatous arteriitis. The ultimate result of the process is, that the lumen becomes obliterated and the vessel converted into a fibrous cord. As a result of this obliteration, two effects are conspicuous. The one is caseation and softening of certain tracts supplied by the affected vessel, and the other is the capillary dilatation referred to above. The former of these corresponds to the large yellow and cheesy-looking deposits in the cicatricial tissue, noticed in the naked eye description. The tracts which become caseous are either round or sinuous in shape, and the first indication of their being in process of necrosis is, that the cicatricial tissue becomes dusky in appearance, and of a brownish colour with transmitted light. A line of demarcation then forms between them and surrounding parts, and the whole affected area becomes granular and caseous. They may remain in this caseous state, or may soften in the centre and form cavities. The cavities enlarge and have ragged edges, and in this condition are frequently mistaken for bronchi undergoing ulceration. We have little doubt that most of those cases described as "ulcerative bronchitis" have got their name from the presence of cavities formed in this manner. The other result we have referred to already, as seen in the abnormally large size and number of the capillary blood-vessels ramifying in the cicatricial tissue. It is easily explained on recognised principles. Certain vessels become obliterated and the anastomotic branches enlarge to compensate for this, giving rise to an almost nævus-like dilatation in some parts. The same cause—the obliteration of the small arteries—seems to react upon the right ventricle of the heart, and induces the hypertrophy of it which is so commonly associated with chronic interstitial pneumonia.

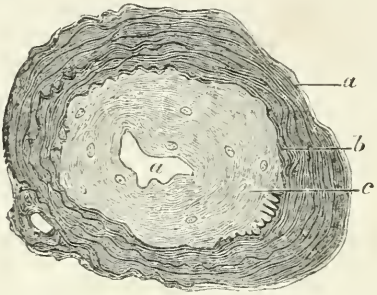

FIG. 34.—Partially obliterated artery in chronic interstitial pneumonia. *a*, contracted lumen; *b*, elastic laminæ; *c*, thickened intima.

We have seen what the cause of the large caseous nodules previously referred to is; they are portions of tissue which have undergone necrosis from the obliteration of the artery supplying them. We have, however, pointed out that there are nodules met with in this disease much smaller in size, situated either in the neighbourhood of the former, or in the pleura, and which have a grey colour and gelatinous or cartilage-like aspect. What are these? We have not the slightest hesitation in saying that they are tubercles. It would be out of place to enter into the minute description of the structure and formation of tubercle at present, but our ideas on the subject will be sufficiently understood for the purpose we have in view, if we state that a tubercle, it matters not in what organ or tissue it is situated, always has, when fully formed, the same structure. This structure is one of the best marked of all the neoplasms, and can be recognised as that of a tubercle in from two to three weeks after it has commenced to grow. It consists, to be brief, of a markedly rounded growth, quite isolated from those in its neighbourhood by means of a fibrous capsule which surrounds it, and limits its dimensions. It is seldom so large as a millet seed, but might more accurately be compared to a mustard seed in size. Its structure is comprised within the fibrous capsule, so that, in many respects, it is analogous to an encysted parasite. It consists essentially of one or more large giant cells, usually placed centrally, from whose periphery numbers of processes radiate outwards, which, by dividing and subdividing, constitute a reticulum, in which leucocytes with small giant cells are more or less abundantly contained. The reticulum terminates by ending in the concentric fibrous capsule at the periphery. We will not discuss the opposing views of M. Charcot and others in regard to this, but simply state that having *constantly* found the structure above described in those neoplasms known as miliary tubercle, found in the same or neighbouring organs in which a *softening caseous mass* is situated, and never having found the same structure in any other body, we are constrained to conclude that there is a something having the above structure, which differs from all ordinary inflammatory products, and for which, accordingly, we retain the name of tubercle. We prefer employing this name exclusively for those structures in contradistinction to all others found in the lung, because it was originally given to them on the supposition that they were identical with those tumours found in the liver, peritoneum, and other organs, in general tuberculosis. They are identical, and we would consequently exclude all other merely catarrhal or necrotic caseous products from this nomenclature because they do not present this structure, and prefer to call them "caseating catarrhal pneumonia," or "caseous masses," according to their essential pathology.

With this preliminary statement it will be understood what we mean when we state that tubercles are found with great constancy situated in the peribronchial tissue, lobular septa, and deep layer of the pleura. In Fig. 32 one of these is represented, situated in the wall of a bronchiectatic cavity, a situation in which they are perhaps most commonly found. It is represented as seen with a low magnifying power, and many parts of its structure are, of course, consequently invisible. The giant cells, however, are clearly seen, and the general rounded isolated aspect that it possesses is also apparent. Those situated in the pleura, in interstitial pneumonia, are placed in its deep layer, while those in the lobular septa are usually met with along their margins. The caseous sources of infection in the production of these tubercles are generally numerous in chronic interstitial pneumonia, and may be either some degenerated catarrhal products in the air-vesicles or bronchi, or what is more common, some of those softened caseous masses resulting from the obliteration of the small arteries. From the situations which these tubercles occupy, manifestly around bronchi and arteries, at each side of the lobular septa, and in the deeper layer of the pleura, it seems extremely probable that they originate in the lymphatics ramifying in these parts. There is much other evidence to support this view, which we cannot adduce here at present, clearly showing that the first thing noticeable in the evolution of these tubercles in interstitial pneumonia is the formation of a giant cell from lymphatic endothelium, and that this gradually throws out processes, becomes encysted, and in time attains full development.

The bronchi which have become bronchiectatic in such cases are usually markedly deformed. When they are transversly cut, numbers of pointed cavities with sinuous margins are seen, and into the lumen there project peninsulas of the bronchial wall, some of them having a villous or club-shape. These are apparently portions of the bronchi which have been left when the retraction took place, and sometimes the retraction is so great that they appear to be attached to the bronchus only by the narrowest basis. The dilated bronchial wall is often intensely congested, and the swollen capillaries project in loops into the lumen. The basement membrane never seems to be absent however great the bronchial dilatation may be, and it is undoubtedly this which gives the bronchiectatic cavity its smooth appearance. There is always a layer of epithelial cells on its surface, usually more or less transitional in character. It is represented in Figs. 32 and 35. Sometimes the epithelium found in a bronchiectatic cavity, especially where there is much retained catarrhal secretion, is most typically columnar and ciliated, in fact, much more highly developed than one generally finds in those bronchi which are not dilated. The bronchiectatic cavities usually have some pultaceous-looking material adhering to their walls, and this, on microscopic examination, proves to be catarrhal secretion, with numbers of shed columnar cells undergoing fatty degeneration. The side of such a bronchiectatic cavity is seen in Fig. 35, and it will be noticed that there are still adherent to it some perfectly formed and ciliated columnar cells. Immediately under the basement membrane of such a bronchiectatic cavity there is usually a dense deposit of small round cells in an embryonic condition, lying in a more or less complete fibrous stroma.

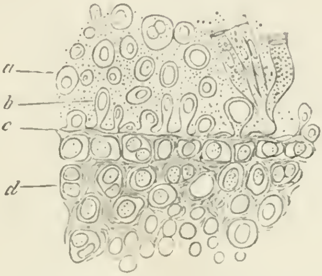

FIG. 35.—Wall of a bronchiectatic cavity in chronic interstitial pneumonia; *a*, cellular débris in cavity; *b*, columnar and transitional epithelial cells; *c*, basement membrane; *d*, cellular infiltration of wall.

The bronchial cartilages are invariably in a state of atrophy, and are undergoing absorption (Fig. 27), the process by which they are removed being that already described. Muscular fibres are not usually found in such bronchiectatic cavities. They seem to be entirely removed at an early period of the disease, apparently by atrophy from cicatricial pressure.

The air-vesicles sometimes contain a little secretion, it may be, inhaled from the bronchi, but at other times probably formed within them. Our reason for supposing that it is sometimes formed within them is that it presents, on certain occasions, a croupous and not a catarrhal character. The cells within it are small and round, and they are imbedded in a mass of fibrin. This, of course, is only what would be expected with such an amount of interstitial inflammation going on in the neighbourhood. Caseation is sometimes met with in the accumulated secretion, but this is comparatively unusual.

The lymphoid deposits which are found round the large bronchi, and which we cannot look upon otherwise than as small lymphatic glands, are in some cases the subject of great inflammatory infiltration, proving in certain instances too much for the nourishment supplied to them, so that caseous degeneration ensues.

(*To be continued.*)

OBSERVATIONS ON THE LAWS OF HEALING BY DRUGS.

BY WILLIAM SHARP, M.D., F.R.S.

(*Continued from* p. 278.)

II.—Action on the Seat of Disease.

The drug to be given as a remedy must have been found to act in health on the principal seat or seats of the disease to be treated.

A French medical historian has taken pains to prove the truth of this fact: "Neither physiology nor pathology, whatever development they may acquire, can ever serve for the primary and immediate foundation of therapeutics. There is, and there always will be, between the knowledge of a disease and the determination of the appropriate treatment, an interval, a void, which the human mind cannot fill up except by the aid of experiment."[1]

This fact will scarcely, I think, be questioned now. It remains, therefore, for us to inquire what experiments will enable us to leap over this gap, or better, to build over it a permanent bridge. Various expedients have been tried by which to clear this "hunter's leap;" a few may have got across, but others could not follow them. It is proposed to build a bridge firm enough for every physician to pass over in security and confidence.

It is evident that the natural history of diseases must necessarily be learned by observation from the sick; and it has now been made apparent that the action of remedies is to be learned by experiments on the healthy. These two methods, of observation and experiment, may be considered the foundation of the bridge. The former must be left to other opportunities for consideration; the latter—experiments on the healthy—is our present study; and we have next to ask: What is the knowledge thus obtained? and, How are we to use it? And first, What is the knowledge we have thus obtained?

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[1] Renouard: *Lettres sur la Médicine au dix-neuvième siècle. Quatrième Lettre.*

It has been shown in former essays[1] that all the common causes of disease have a local action; that is, that they act partially on some organs or parts of the body more powerfully than on others; consequently each cause produces a disease more or less characteristic of itself. For example, the contagion of scarlet fever acts on the brain, the throat, and the skin; that of measles on the eyes, the air-passages, and the skin; marsh air causes intermittent, and bad water typhoid fevers; moist hot air causes catarrhal complaints; moist cold air rheumatic ailments; and so of the rest. There is, therefore, in nature no division of diseases into "general" and "local." How these causes act, and why in the way they do, we have no knowledge; let us not fall into the error of inventing explanatory hypotheses, which are not better than useless guesses.

Drugs are a cause of disease, and they are no exception to the law of local action. Each may be known by the parts on which it acts. We know not how the action is carried on, nor why one part is acted upon rather than another. We must be content with the phenomena our senses can observe. It will startle many medical minds to hear medicines spoken of as *a cause of disease;* so little are they accustomed to observe the consequences of their mode of practice. If these medical men would watch the effects of the doses they are in the habit of giving, they would learn that many of their patients were no longer suffering from the ailment, often a slight one, for which they first sought medical advice, but from more serious diseases, the effects of the treatment to which they have been subjected. Two hundred years ago Sydenham lamented how often, in his time, sick people died "not of the disease, but of the doctor;"[2] and it is so true still that it amazes as well as distresses those whose eyes are open to see it.

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[1] *Essays on Medicine:* Essay XVII.

[2] *Works of Sydenham*, by Sydenham Society, vol. i. p. 244.

The only effectual remedy for this persistent evil is to learn what drugs *can* do, by taking them ourselves while we are in health. To be ourselves convinced that the medicines we give our patients are able to make them worse will be no small benefit to them; and when we know in what way the drugs have made us ill, if only ordinarily attentive to our duties, we shall recognise similar mischievous effects produced by them on the sick. Such recognition will make us more cautious and unwilling to give them again in the same manner. A man who has himself suffered will, commonly, have more sympathy for the sufferings of others. So it will be a very great gain, and in more ways than one, for the proving of drugs to be undertaken afresh.

Let us remember how drugs differ from food. Food, after mastication, is digested in the stomach, and chyme is formed; this is mixed with bile in the small intestines, and chyle is separated from it; this is absorbed by the lacteals; is carried by the thoracic duct to the left subclavian vein, and there poured into the circulating blood; this is sent by the right side of the heart to the lungs; the blood is there decarbonised; is returned to the heart; and is sent by the left ventricle to all parts of the body for their support and renewal. Drugs have none of this power; they cannot make blood; nor nourish the body; nor keep it, as food does, in a healthy state. In all doses or quantities they act more or less injuriously in health. In certain doses — how contrary to expectation! — they act curatively in disease. Substances put into this class, by the possession of these two characters, agree further in having not a general, but a local action on certain organs or parts of the body in preference to other parts, each drug having its own locality of action.

This general fact—the local action of drugs upon the living body—is very surprising, and no explanation of it has yet been discovered. It seems difficult to some men even to conceive it; but "there is ample experience to show that our capacity or incapacity of conceiving a thing has very little to do with the possibility of the thing itself." The particular facts from which this general fact is an induction are given in a former essay (No. XVII.) Analogy supplies us with similar conditions in other sciences. For example, chemistry is founded upon the same general fact: every experiment which is performed in the laboratory is an example of local action as conspicuous as in the local action of drugs in the living body. The chemist and the physician are in the same darkness as to the manner in which these actions are performed. The words "elective affinity," if used by either chemist or physician as an explanatory hypothesis, are words without meaning.

Local action characterises, by its effects, the action of each drug; it is regular and consistent when other forces do not interfere with it; and its tendency is to be the same, when the same dose is given, in disease as in health. Sydenham's conviction that diseases are governed by laws may be safely entertained respecting the working of drugs. He says, "I am convinced that nature here, as elsewhere, moves in a regular and orderly manner."[1]

If there is any action of drugs which deserves to be called *general*, what it consists in, or how it manifests itself, has not yet been observed. The *local* action of each drug is certain; it can be seen and felt. It is our duty to study it; to know the effects which it produces, and the laws which govern it. The time to study any general action will not have come till we have some evidence of its existence. We have already some knowledge of local action, but not enough to accomplish one great object respecting it; namely, to apportion to each organ or part of the body all the drugs which belong to it.

Several years ago the attempt was made to accomplish, from recorded provings, the task of assigning each drug to the organs on which it acts. Such leisure as could be stolen from practice during four years was devoted to this labour, not only with zeal, but with a lively expectation of success, and a specimen of the work was published in 1861 (Essay XIV.) But it was found, with great reluctance, that the arrangements of these provings rendered success impossible. New provings may remove the difficulty, and the work may then be done.

Even now, however, we know a good deal of the local action of many drugs; so that it is often possible, after a careful diagnosis of a patient's case has been made, to find a drug whose action corresponds, as to its seat, with the case we have in hand. About twenty years ago, a conversation with the late Dr. William Baly, then physician to the Queen, took place. I was insisting that drugs acted as remedies in small doses upon the same parts on which large doses acted injuriously, when Dr. Baly suddenly looked at me with great earnestness and exclaimed, "Then, will opium cure apoplexy?" He had understood me. Happily, from my own experience an affirmative answer could be given him: "Yes, when the apoplexy has arisen from pressure on the brain produced by venous congestion, then small doses of opium can cure; when there has been slight rupture of vessels, and a small quantity of blood extravasated, arnica is a better remedy; when the rupture is extensive, and the bleeding large, it is not likely that anything can cure."

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[1] *Sydenham's Works*, vol. i. p. 72.

In 1856 the facts contained in the rule of practice we are now studying were expressed as follows:—"Each drug selects certain portions or organs of the body upon which to produce its injurious action. The injurious action produced upon the parts or organs of the body thus selected is more or less peculiar to each drug; it is characteristic; so that by this action each drug may be known from the rest. Drugs are to be given as the best remedies for the diseases which affect the same parts or organs of the body which such drugs affect" (Essay XIII.) The subject has continued to engage attention; in 1868 another Essay (XVII.) was published; and others have followed.

Local action, that is, the local action of all the common causes of disease, and the similarly local action of all drugs, will, I think, be acknowledged in the future. The individual facts which this law embraces are becoming more and more recognised; the general fact or law has not yet been accepted; but it will be: for physicians of every school avail themselves of it, consciously or unconsciously, in every prescription they write.

Such is the first general fact or law we have obtained the knowledge of by experiments on the healthy. One grand objection to it has been urged by a physician of much ability and experience, in these forcible words:—"I can, in a manner, sympathise with you in the search for a law of therapeutics;

but I feel that no such law will ever be found that will not include within it a full recognition of the almost infinite diversity of constitution that is presented by individuals. There can be no question as to the power of at least a certain number of drugs to act in an almost uniform and unvarying way; but the constitutional habit of each patient must be taken into account in judging of the results." It is not difficult to answer this objection, though it looks so formidable, and is so vigourously expressed. For, first, as regards the proving of drugs in health, this physician will find, on becoming acquainted with them, that very great attention has been paid to this part of the question, so that many drugs are already known to belong to particular constitutions, and future provings, made in the same manner, will add to this knowledge. And, secondly, as regards the use of these drugs as medicines, he will also find that to consider the constitution of the patient is an essential part in the selection of the drug. The admission that a certain number of drugs do act in an almost uniform and unvarying way is good, and suggests the remark that if he will extend his observation he will find that what he already sees to be true of a certain number will be found to be true of the rest.

We have next to ask: What use can be made of the law of local action? It is at once evident that our knowledge of local action, both of the causes of disease, and of the drugs we give as remedies, may be turned to practical account in two opposite ways: (1) we may give medicines which will avoid the organs diseased, and which will act upon the healthy, or comparatively healthy parts; or (2) this process may be reversed, and we may give such medicines as will avoid the healthy parts, and will act on the organs principally affected.

The first of these methods, under the names of revulsion and counter-irritation, has been followed for a long period. The objection is plainly visible: it adds a new complaint to that already existing. It has been called the *indirect method*. It is an old principle, exemplified also in whipping the innocent page for the misconduct of his young master. The second method is the one now recommended. The advantage of this is also plainly visible. It leaves well alone; it tries to cure where the mischief exists. This is the *direct method*.

Surely, then, it will be agreed that the best use we can make of our knowledge of local action is to cure by acting on the diseased parts, and allowing the healthy to remain healthy. But it may be asked: Can this be done safely? And, if safely, can it be done successfully? If medical men will follow the advice which John Hunter gave to Jenner, and "not think, but try the experiment," they will be able, after a competent trial, to answer these questions for themselves. The method applies, of course, to chronic diseases, as well as to acute ones; but from the circumstances of the severity of symptoms, and the shortness of time in acute cases, the reply in these becomes more conspicuous though in the end perhaps not more convincing. Let opium be given for suitable cases of apoplexy; belladonna for suitable cases of inflammation of the brain and scarlet fever; arsenic in like manner for gastritis; phosphorus in enteritis; cantharides for strangury; aconite and digitalis for contrary morbid conditions of the heart; and so on. It is to be remembered that each case is to be studied by itself; so that when there are three or four drugs which seem to belong to it, the one may be chosen which suits it best. The knowledge which will enable us to follow this plan is twofold: to know the drugs which have a local action on the organs diseased in a given case, and to know the dose which shall not aggravate the mischief, but cure it. How this knowledge of the *dose* may be found shall be explained in the concluding portion of this paper.

Thus far, then, the building of the bridge over the chasm which separates diseases from their remedies has been proceeded with. One arch, called *seat of action*, has been constructed; its materials are *anatomical*. The remaining one is called *kind of action*; its materials must be *physiological*.

(*To be continued.*)

REMARKS ON THE TREATMENT OF CHRONIC ULCERS BY MARTIN'S BANDAGE.

BY A. F. M'GILL, F.R.C.S.

Surgeon to the Leeds Public Dispensary.

THE treatment of chronic ulcers of the leg in out-patient hospital practice has not hitherto in my experience been attended with great success. It has often consisted in the prescribing of some lotion or ointment, and in the administration of good advice which the patient has been unable to follow. It is an easy thing to tell a patient to go to bed for a month or two, but unfortunately a man who has to work for his family, or a woman who must support herself, often finds that rest is the last thing possible; if they wish to be admitted into a hospital, they are told that "ulcerated legs of long standing" are according to law not admissible, and so they go on month after month, and year after year, with an unhealed leg which is a source of discomfort to themselves and of annoyance to their friends.

Since the commencement of the present year I have used with excellent results the solid rubber bandages introduced by Dr. Martin of New York. The bandage has been put on next the skin without any other dressing: the patient has been instructed (1) to remove the bandage on going to bed, (2) to wash the leg with warm soap and water, (3) to sponge the ulcer with carbolic acid lotion and keep this applied all night, (4) to have the bandage well washed and hung up unfolded during the night, (5) to again wash the leg in the morning, and (6) to apply the bandage before leaving bed.

The following cases are fairly typical.

1. T. N., æt. 60; small ulcer, size of half-a-crown which had been unhealed for six months. The skin over the whole leg is red and shiny, he has been suffering on and off for twenty years; cured in a fortnight, though similar ulcers had hitherto always taken six months to heal: when offered the price of the bandage in return for it said he "would not take a pound for it."

2. H. R., æt. 56; leg ulcerated for two years, the skin is hard and callous and ulcerated in all directions, there being numerous ulcers varying from one to three inches in diameter: has not been able to walk for six months. The application of the bandage gave immediate relief and enabled him to walk. Cure in 10 weeks.

3. E. R., æt. 52; ulcer of leg 8 years, callous edges which are somewhat inflamed, measure three by two inches. The bandage caused pain for the first week, but since then has been quite comfortable; after two months' treatment the ulcer is nearly healed.

It is unnecessary to multiply cases; of about twenty cases treated in this manner two only have been unrelieved. In both cases the want of success was due to the fact that the ulcers were inflamed and painful when the bandage was applied; the application much increased the pain and necessitated the discontinuance of the treatment. If applied in suitable *chronic* cases the bandage is more efficacious than any other method of treatment. It is, I think, a most valuable addition to the appliances used in minor surgery.

THE TREATMENT OF INDOLENT ULCERS BY MEANS OF SHEET LEAD.

BY F. P. ATKINSON, M.D., KINGSTON-ON-THAMES.

A GOOD deal of attention has been attracted during the past year to the American treatment of indolent ulcers by means of Dr. Martin's indiarubber bandages, and the reports received on all sides as to the value of this method are eminently satisfactory. I would, however, urgently request that a trial be given to the system which I was in the habit of adopting in all such cases at St. Bartholomew's Hospital, Chatham, some thirteen years ago, viz., the application of sheet lead, moulded to the shape of the leg and kept on by an ordinary calico bandage. The size of the lead should be sufficient to cover the ulcer completely and lap a little over the whole skin ; the edges and angles should be well rounded, so as not to chafe or irritate ; it should be about an eighth of an inch in thickness, and moulded very accurately to the shape of the leg, so as to allow of no indent being apparent on the surface. After it has been carefully fitted, the leg should be bandaged from the toes upwards, and all that then need to be done is to uncover the ulcer night and morning and allow some water from a sponge to trickle over it. The granulations should never be touched with the sponge itself. I believe that the rationale of this treatment is pressure, the same as in the case of the elastic bandage, though there may be also some action produced by the secretions upon the lead, as is said to take place when the lead nipple-shields are used. The great advantages of the system proposed are simplicity and cheapness, though as regards the former I think it must yield the palm to the elastic bandage. It would appear that in some parts of Africa the natives use sheet copper, and with some success, but I cannot say I have ever tried it myself.

Reviews.

The Ear: its Anatomy, Physiology, and Diseases. By C. H. Barnett, A.M., M.D. Philadelphia.

Foremost among the numerous recent contributions to aural literature will be ranked this volume by Dr. Barnett. The objects he has kept in view in writing it, as stated in the preface, are to present a concise *resumé* of the present aspect of otology, and to indicate the most profitable directions for future research. It is no reflection on the practical character of the book to say that the former result has been reached more satisfactorily than the latter. The first 160 pages are devoted to the anatomy and physiology of the ear, and show an extensive acquaintance with the work of Continental authorities, which the author has ably epitomised to the exclusion of the prolix attention to detail too often displayed by these investigators. In the section on the examination of the patient, the variations of acoustic phenomena are clearly dealt with, and a more practical acquaintance with the science of acoustics as applied to otology is indicated than is usual in works of this kind.

Perhaps the best bit of clinical writing in the volume is that on inflammations of the mastoid process, where the indications for the differential diagnosis of its various phases are given with clearness and precision. The operative proceedings demanded occasionally are also well detailed, while an admirable bibliographical reference to the literature of the subject is appended; as is the case at the end of each important section.

To the important sequelæ of suppuration in the middle ear considerable discussion is justly given. Vertigo, epilepsy, distressing tinnitus, local and general pareses—all due to this cause, a fact for the most part known only to the aural student—are too frequently referred to central lesions, and submitted accordingly to treatment other than aural, and therefore wide of the mark. The relation of acute purulent inflammation of the ear to dentition, as well as to the exanthemata, receives valuable comment, respecting the grave import of this complication to the life of the patient. It is a strange anachronism that few family physicians, or even those specially devoted to children's ailments, are at the pains to familiarise themselves with the objective symptoms of this disease; in fact, it may be safely affirmed that very seldom is the ear thought of in connection with the perilous condition of the patient.

It is impossible to do justice to this volume of over 600 pages in a necessarily brief notice. It must suffice to add that the book is profusely and accurately illustrated; the references are conscientiously acknowledged; while the result has been to produce a treatise which will henceforth rank with the classic writings of Wylde and Von Tröltsch.

Hydrocele: its Several Varieties and their Treatment.

By S. Osborn, F.R.C.S.

In this little work the author makes some interesting observations on the pathology of the different forms of hydrocele. He divides hydrocele of the tunica vaginalis into two groups—the visceral and the parietal; the former produced by the spreading of mischief from the body of the testes, or from the epididysms to the visceral layer of the sac, the latter depending on some external cause, such as a blow or other injury, leading to inflammations of the parietal layer. "Of visceral hydroceles the following are examples: that following epididymitis, that following syphilitic orchitis, and that following cancerous disease of the testis;" while parietal hydrocele is well illustrated in the kind which is seen in old persons, in whom the scrotum is pendulous, and the circulation through the swollen arteries languid and feeble, so that transudations readily occur. This division is of practical importance; for in the former variety the treatment of the hydrocele must be subsidiary to the treatment of the original complaint. Hydrocele in young adults is chiefly visceral, while in the old it is usually parietal. As to radical cure by iodine injections, the author states that of fifty-four cases in which he practised this method nineteen had been previously injected unsuccessfully. Of these fifty-four he lost sight of twenty-nine; but in eighteen of the remaining twenty-five the hydrocele recurred. It is to be regretted that the writer adds to rather than diminishes the confusion with which the student has to contend in respect to the nomenclature of hydrocele by terming what is commonly clearly understood as congenital hydrocele—"hydrocele of the vaginal process;" by speaking of diffused and encysted hydrocele of the cord as the same conditions, except that the former is a larger collection of fluid than the latter; and by mis-numbering his figures, so that, at p. 53, fig. 6 is referred to as fig. 4, and at p. 54 fig. 4 is called fig. 5 b. The most interesting chapter is that in which the author traces the formation of encysted hydrocele, near the testis, to an affection either of the hydatid of Morgagni, or of the organ of Giraldis, a connection which he fairly establishes, and by which he explains conditions that have hitherto been the source of much difference of opinion. His chapters on clinical diagnosis and treatment swell the size of the volume without, we venture to think, adding much to its value. On these questions the student and practitioner will still do well to rely on such authorities as Curling, or Holmes, or Humphry.

Lectures on Dermatology, delivered in the Royal College of Surgeons of England in 1876, 1877, 1878. By ERASMUS WILSON, F.R.S., F.R.C.S. London: Churchill.

MR. WILSON'S writings on cutaneous medicine are so well known that when we say that this volume of lectures is well calculated to maintain its author's recognised reputation as a sure and keen observer, and as a dermatologist full of resource, we have already awarded to it a high measure of commendation. The subjects treated in the volume are derangements of colour of the skin, affections of the nails, hair, and cutaneous glands. The treatment of some of these affections is, as we all know, hopeless, which does not, however, prevent Mr. Wilson from doing his best. The local measures recommended for pigmentary affections appear to be selected very judiciously. For the removal of pigmented stains Mr. Wilson recommends solution of the perchloride of mercury, in emulsion of bitter almonds, in the proportion of two or three to five grains to the ounce. "Where practicable, it should be kept for a considerable time in contact with the skin, and carefully watched, to avoid the setting up of severe inflammation."

Mr. Wilson's scepticism regarding the parasitic nature of tinea is well known, which does not prevent his treatment being admirably adapted to control the disease. "The indications for treatment, according to his view of their pathology, is to excite a more healthy action in the follicles by mild stimulants, and to improve the tone and nutritive power of the skin and of the general system by a nourishing regimen, and by tonic remedies, especially by the judicious use of arsenic." The tonic action of arsenic is a strong point with Mr. Wilson. "It is quite true," he observes, "that in some instances children will not thrive even on the best selected food; but in these cases it is perfectly surprising what may be accomplished by a few drops of arsenical solution added to their food." Even in the treatment of hairiness it finds a place for excessive growth of hair in abnormal situations. "Our primary attention should be directed to the improvement of the general health, and our next to the removal of the offending growth. In the treatment of the general health we shall find arsenic as an improver of the nutrition of the skin, and also as a nutritive tonic of much value. It is suitable to the young in whom some disorder of abdominal innervation may be present as a *causa mali*, and equally suitable to those of middle life and the aged, when other indications have been attended to; likewise as a nerve tonic and as a nutritive tonic." Even for baldness "arsenic may be advantageously prescribed in doses of two or four minims three times a day, directly after food, and in any convenient vehicle." We wonder how many practitioners of Mr. Wilson's standing have been able to preserve intact this simple and remarkable faith in the virtues of arsenic! Whether Mr. Wilson's views regarding it are in accordance with the best physiological knowledge we leave the physiologists to decide. "As a prophylactic against ringworm, and also as a remedy for its cure, he begins by enforcing a generous and nutritious diet; meat, in some form, three times a day, puddings made of flour and suet and varied in flavour and taste, and a little good beer. The quantity must be regulated by the appetite of the child. . . . How often do we find the diet of children reduced to the miserable standard of bread-and-butter and milk-and-water for breakfast; for dinner, meat and milk and rice-puddings with water; and in the evening, bread-and-butter and milk-and-water. No better method could be devised for engendering ringworm, scrofula, consumption, and cancer." These quotations show that the author, whatever his theme may be, is not in the habit of giving forth an uncertain sound.

The volume contains some very interesting accounts of persons with abnormal development of hair.

Atlas of Skin Diseases. By LOUIS A. DUHRING, M.D. Part IV. Lippincott & Co.: Philadelphia and London. 1878.

WE welcome with satisfaction another instalment of Dr. Duhring's Atlas. Part IV. contains four excellent portraits in illustration of vitiligo, alopecia areata, tinea favosa, and eczema rubrum.

On the So-Called Eczema Marginatum of Hebra. By L. DUNCAN BULKLEY, M.A., M.D. New York: Putnam. 1877.

DR. BULKLEY treats this parasitic disease "by the free external use of sulphurous acid, as strong as could be procured and used, and judging from the histories given, nothing more could be desired. In every case it gave immediate relief to the itching, and produced a marked improvement in the appearance, and in some instances it was the only remedy employed from beginning to end, and sufficed entirely to remove the disease."

Transactions of the American Dermatological Association for 1877. New York: Putnam. 1878.

THESE Transactions, published concisely in pamphlet form, give a summary of much useful work done by the enthusiastic dermatologists of the United States. Amongst other papers was one read by Dr. Brooks of Chicago, "On Acute Conditions of Disease excited by Iodide of Potassium." Dr. Brooks stated that "when employed in unusually large quantities within a brief period he had found three symptoms to follow in a considerable proportion of cases, namely: fever, arthritis, and iritis. The remedy suggested was the employment of tincture of colchicum with calcined magnesia in purgative doses."

On Ringworm and its Management. By TILBURY FOX, M.D., F.R.C.P. (Reprinted from the *Lancet.*) Renshaw. 1878.

A *resumé* in compact form of the symptoms and treatment of ringworm. Dr. Fox insists on the necessity of a regular examination of the heads and bodies of children at school in order to prevent outbreaks of the disease.

Archives of Dermatology. Vol. IV. Nos. 1 and 2. New York: Putnam. 1878.

THIS journal under Dr. Bulkley's management continues to be conducted with much spirit. It contains not only original papers which represent most of the dermatological work done in the States, but excellent abstracts of all the European work in this department.

Clinic of the Month.

Lead Poisoning.—Dr. Edelmann discusses a few hitherto little known causes of lead poisoning in a recent *Thèse de Paris.* Of four cases enumerated, three occurred respectively in a workman employed in making bullets at Vincennes, in a hairdresser, who dyed hair, and in a man who had been employed in making ice-cream. The fourth case presented several interesting symptoms. The patient was a woman who earned her living by polishing cameos. When she was received in the hospital both her upper extremities were almost entirely paralysed, and most of the paralysed muscles were atrophic. The extensors of the fingers and hands, and also those of the arms and of the shoulders, were affected, so that the arms hung down, and could only perform a few movements if they were placed horizontally. They then would reach the face gradually, climbing, as it were, to it, the fingers grasping the dress and being supported by it. The flexor muscles of the fingers and of the forearm, could still execute the greater part of their movements; but the flexors of the forearm were very feeble, and were considerably atrophied. Galvanic contractility still existed in the paralysed members, and the left side seemed to be more affected than the right. The patient's gums presented the blue line characteristic of lead poisoning. A year after entering the hospital, she first began to suffer from paralysis of the superior extremities, which, however, was confined to the extensors, and was speedily removed by medical treatment. Four months before admission she had violent colic, which lasted for some weeks; she then had pains in both upper limbs, and noticed that her arms were growing weak. This woman had been polishing cameos for seven years. The work is done by holding a cameo close to one end of a lead cylinder, which is fixed horizontally to a wheel, and rotates very quickly. The cylinder is generally moistened with a mixture of water and some kind of polish; but the patient, having discovered that her work was more easily done by using vinegar instead of water, for the last eighteen months used vinegar constantly. Since this time, she had distinctly been suffering from lead poisoning. In the room where she worked, lead cylinders were being made, and several other persons worked also, who all more or less presented symptoms of lead poisoning. The patient was treated with electricity, sulphur-baths, and tonics. Several of the groups of muscles have been restored to their normal state; but the extensors are still paralysed. (*British Medical Journal*, March 8, 1879.)

The Physiological and Therapeutical Effects of Adonis Vernalis.—As it had been noticed that the effects caused by an extract of adonis vernalis were similar to those produced by digitalis, and that in some cases of compensatory troubles, the action of the heart could be restored by it, even if digitalis had proved unsuccessful; it was undertaken, at Prof. Botkin's instigation, to make a series of experiments on frogs, which he subsequently published in the *St. Petersburger med. Woch.*, January 6, 1879. The results of his experiments are as follows:—A diluted solution of the extract adonidis vernalis aquosum was injected into the crural lymph-bag of a frog, the heart of which had previously been laid bare. It was then noticed, after a certain lapse of time, which in most cases was in indirect proportion to the dose which had been injected, that the ventricle began to contract more strongly. During the diastole the surface of the latter was covered by swellings of different size, resembling aneurisms. These disappeared entirely during the diastole. In a few minutes the contractions of the ventricle decrease in number, though not in strength, and the swellings become much larger. Later on the ventricle often remained for several seconds in systole, the sinus venosus and the auricles were considerably dilated and worked unsuccessfully. At last after two to four contractions of the auricles a small quantity of blood passed into the ventricle, which again contracted spasmodically, and this was repeated for a few minutes. At last the heart assumed a very characteristic shape, the ventricle was strongly contracted and sometimes very pale, the atrium and sinus venosus were considerably dilated. The contractions of the heart and sinus went on for some time, then stopped, and the heart ceased to beat, still retaining the shape already noted. The frog generally survived the operation, and jumped about, although his heart had ceased beating. If the heart in this state is stimulated by pricking the ventricle with a needle, it responds at first by a few contractions of the atrium and the ventricle. After a while the prick only calls forth a few useless contractions of the atrium. In short, after a certain time stimulation by pricking has not the least effect in causing the heart to pulsate. The heart retains its very characteristic shape in spite of all stimulations or irritations which may be applied, such as hypodermic injections of atropin, faradic currents, section of the vagus nerve on both sides, &c. All these experiments, combined with the clinical experiences, lead to the supposition that adonis vernalis contains a poison analogous to digitalis, which strongly affects the heart, but has certain peculiar properties, one of them being the total absence of dangerous effects, even when this has been taken for a long time consecutively. (*The London Medical Record*, February 15, 1879.)

Tartrate of Morphia for Hypodermic Injection.—Mr. Erskine Stuart draws attention to the tartrate of morphia, as a substitute for the injectio morphiæ hypodermica of the British Pharmacopœia. He states that he has made extensive trial of the substance, and has come to the conclusion that it is the best preparation of morphia for hypodermic injection. He has also found that it is an excellent preparation for use by the mouth, as its strength may be depended upon. Tartrate of morphia is a white powder, not at all unlike the morph. mur. in appearance, bitter to the taste, and although quite soluble in cold water, yet the solution so formed is milky, so it is better to use hot water. It is soluble in water to a great extent, without either the aid of acids or spirits,—indeed, the solution for hypodermic injection made from it is of the same strength as the Pharmacopœia injection, viz., 40 grains to the ounce, or in short 1 grain of the tartrate in 12 minims of the solution, so that 2 or 3 minims is sufficient for an injection. The advantages which this solution possesses for hypodermic injection are these: (1) It is bland and unirritating, being as mild as water, whereas the Pharmacopœia injection is intensely irritating even when prepared by the most experienced chemist. (2) The solution of the tartrate can be kept fresh for any length of time, while the Pharmacopœia injection soon changes colour and goes wrong. (3) The ease with which this solution of the tartrate is prepared by merely weighing out the quantity and dissolving it in a certain measure of hot water. The tedious process of the British Pharmacopœia consisting of repeated filterings and neutralisings, stands out in contrast to this easy process. (4) The concentrated nature of this solution renders it a very convenient form for administering by the mouth, as it occupies such small space, and can be carried most conveniently. (*Edinburgh Journal of Medicine*, March, 1879.)

On the Injection of Warm Water into the Vagina in Certain Cases of Labour.—Dr. Kilner shows that the injection of warm water into the vagina in properly chosen cases accelerates the labour without causing any increase of suffering to the mother. The cases to which this method of treatment is particularly applicable are those in which the os uteri is thin and rigid and the perineum is unyielding. The only instrument required, besides a bowl of warm water, is a Higgens's syringe fitted with a vaginal tube; but this apparatus can be improved by the addition of a yard of india-rubber tubing, three-eighths of an inch in diameter, joined to the vaginal tube so as to carry off the water direct from the vagina into a receptacle, thus avoiding wetting the bed. The water should be as warm as the patient can comfortably bear, and in practice it is advisable not to begin with water raised to the full temperature, but gradually to add boiling water until the temperature of about 105° F. has been attained. The injection requires to be continued from five to twenty minutes according to circumstances. But there is one thing to be borne in mind, that unless the injection be given with a due regard to temperature, it is totally useless, so that to avoid disappointment it is better to administer it oneself rather than leave it to a nurse, unless she can be fully relied upon. The effect caused is a relaxation of the soft parts, and sometimes in addition the labour pains seem to be increased. Besides this the patients generally say that the injections make them feel more comfortable. (*The Lancet,* March 29th, 1879.)

Ethylate of Sodium.—Dr. Purdon has been recently trying the ethylate of sodium in the Belfast Skin Hospital. His first case was that of a nævus situated on the forehead, communicating through the bone with the cerebral circulation. The patient was a boy, aged three years; the nævus being about the size of a small walnut. Four applications of the ethylate of sodium removed the deformity. The author agrees with Dr. Richardson in believing that the remedy is a specific for nævus. He has also removed a small patch of cutaneous cancer on the lower lip by the ethylate; whilst three cases of lupus and one of warty growth on the back of the hand are progressing satisfactorily under treatment. The four results obtained by the action of the ethylate of sodium, viz., first, removal or absorption of water from the tissue into the ethylate; secondly, destructive action of a caustic from the caustic soda that is formed; thirdly, coagulation from the alcohol that is produced; and fourthly, prevention of decomposition of the dead organic substance that is formed—were observed in the case of nævus. (*The Lancet,* April 5, 1879.)

Hypodermic Injection of Hyoscyamia.—Dr. Leared quotes the following case, which is of interest in connection with the great sedative power of the drug hyoscyamia:—A gentleman, the subject of phthisis, had morphia nightly injected subcutaneously on account of sleeplessness and a condition of general irritability. The quantity had been gradually increased until a grain was reached. Wishing to break through the noxious habit Dr. Leared substituted for the morphia one fortieth of a grain of hyoscyamia. In less than ten minutes after the injection the patient complained of giddiness, with a sense of compression at the top of the head. In half an hour after the injection some milk recently swallowed was vomited. Delirium now set in, the patient talked incoherently, and was with difficulty kept lying down. A curious effect of the drug was observed. Every object seemed much nearer to the patient than it really was. He would grasp wildly at something invisible to the bystanders, and this on inquiry was found to be the bedpost, placed at a distance of about four feet from him. When a cup was handed to him, he invariably tried to seize it at a point nearer than where it really was. He constantly caught at insects, with which he said the bed-clothes were covered. The pulse was quickened, but its volume seemed little altered. The pupils were widely dilated, and the sight so much affected that he was unable to read the address on a letter, even when the active effects of the drug were subsiding. The delirium and perversion of vision lasted upwards of four hours, after which time the compressed feeling in the head and the obscurity of vision remained, and it was not until twenty-four hours afterwards that all sensations induced by the alkaloid had passed away. In connection with this case it is noticeable that the patient had been long accustomed to morphia, between the action of which and that of hyoscyamia an antagonism appears to exist. As the latter was injected at the time when the artificial want of morphia was being felt, it may be that the action of the hyoscyamia was intensified by this circumstance. If this be the case caution is necessary when antagonistic drugs are employed in succession in such a way that one is given just when the effect of another has subsided. (*The Lancet*, April 5, 1879.)

Hypodermic Injection of Morphia in Asthma.—Although the sedative effects produced by hypodermic injections of morphia in cases of asthmatic attacks, or of certain paroxysms of dyspnœa, have been well known for a long time, yet most practitioners prefer to employ preparations of belladonna or datura, because they do not tend to diminish the bronchial secretions. M. Huchard, having studied carefully the effects of, and the objections to, the use of morphia in asthma, has come to the following conclusions: In the most intense attacks of asthma, the hypodermic injection of morphia will cause immediate relief. He even goes so far as to affirm that if these injections are repeated, they will, by cutting short each attack at its beginning, succeed in rescuing the economy from this spasmodic habit, and thereby cure the disease. After giving a short historical sketch of this subject, M. Huchard proceeds to study carefully the different forms under which asthma can show itself: he compares pathological facts with the results which have been obtained from the therapeutical study of preparations of morphia, and in this way succeeds in explaining theoretically facts which he had learned empirically from clinical experience. In another part of his work M. Huchard enters fully into the importance of administering morphia preparations hypodermically in other cases of dyspnœa, such as cardiac asthma or uræmic dyspnœa. In a third chapter he dwells upon the different results produced by morphia preparations according to whether they are given hypodermically or by the mouth. He sums up his exhaustive and interesting study in the following words: morphia makes one breathe freely. (*The London Medical Record*, March 15th, 1879.)

Symes on Thymol, and Thymol Camphor.—Dr. Symes in the *Pharmaceutical Journal* publishes the results of his researches on the combination of thymol, chloral hydrate, and camphor, acting as an antiseptic. The two former drugs are rubbed together in a mortar, and an equal quantity of camphor added, which liquefies the whole, and produces a powerful antiseptic. Its virtues were tested on urine containing pus, which was already beginning to decompose. Two drops of the compound were added, and the putrefaction was stopped. If thymol and camphor alone are rubbed together they also become liquid, and this is a convenient form from which to prepare the ointment. Thymol camphor can be mixed in almost any proportion with vaseline, ung. petrolei, or ozokerin, and the thymol will not separate out in crystals, as when thymol alone is used. A solution of thymol in water (1 in 1,000) is sufficiently strong for the spray in surgical operations. If used for the throat, milk and glacial acetic acid will be found to be good solvents for it. (*Ibid.*)

The Treatment of Hepatic and Nephritic Colic.—Dr. Labarde states that the excreting bile ducts are contractile, and can therefore, by the influence of a direct or indirect stimulation, be made to contract spasmodically. Their contractility is similar to that met with in the unstriated muscular fibres, which have been proved by histological anatomy to exist in the walls of the above-mentioned ducts. 2. The mucous membrane of the above ducts is innervated by sensitive nerves, as is clearly shown by the pains which follow the expulsion of gall-stones and the reflex phenomena which manifest themselves by spasmodic contraction of the ducts. 3. These phenomena are specially caused by the presence and contact of foreign bodies, the progress of which is often stopped in the ducts by this contraction. It happens, however, sometimes that these bodies progress upwards towards the gall-bladder. 4. Anæsthetic and antispasmodic treatment is considered as most effective in this affection. 5. Antispasmodic and anæsthetic drugs, such as morphine, chloroform, chloral, &c.,

terminate the state of spasm by distending the ducts and allowing the biliary liquid to accumulate, which acts upon the foreign body as a *vis à tergo*, impelling it towards the intestines. 6. A combination of chloral, morphia, and chloroform will prove a very effective means of obtaining the desired results, viz., anæsthesia of the biliary ducts, by which the expulsion of the biliary calculus is rendered painless, and a favourable influence is exercised over the migration and rapid expulsion of foreign bodies. (*Ibid.* Feb. 15th, 1879.)

Treatment of the Pyrexia of Phthisis.—Amongst numerous contributions to the treatment of phthisis we have collected the following means of combating the febrile state. With this object Dr. R. Bartholow gives atropia. Against troublesome cough morphia may be combined with atropia ; and in the case of vomiting strychnia may be given in the same prescription. In this country Dr. McCall Anderson combats the sweating with subcutaneous injections of atropia; and the high temperature with the internal use of quinine, digitalis, and opium, conjoined with the use of ice cloths. Against the sweats Dr. Fothergill also prescribes belladonna, by itself or combined with opium. In some cases, however, this physician prefers oxide of zinc with hyoscyamus; and Dr. Hayden holds Dover's powder a better anhydrotic than belladonna. Observing that in advanced phthisis hectic depends on purulent absorption, Dr. Douglas Powell has prescribed sodic salicylate. The antiseptic treatment of phthisis is also in favour in Germany, where Dr. J. Schnitzler and Dr. J. Hirschfelder have succeeded in reducing the fever and the sweats by means of hypodermic injections of hydric-carbolate. In Italy Dr. Antonio Lombardo assigns the following effects to the treatment of phthisis with silphium cyrenaicum:—The expectoration is much facilitated; the dyspnœa is diminished, and the circulation becomes more regular ; while no digestive disturbance results from its administration. (*Med. Times and Gaz.*, Aug. 31, 1878.)

Dyspnœa in Acute Pleurisy.—Dr. Dieulafoy considers that dyspnœa is not to be regarded as an habitual symptom of pleurisy with effusion; for he has found that effusion, even when it amounts to a very large quantity, impedes respiration but slightly. This is a point of great practical importance in relation to the indications of thoracentesis. The physiological explanation of the apparently paradoxical statement, that normal respiration is compatible with a large effusion, is the following:—Respiration normally is not effected alike over the whole pulmonary surface, certain parts of the lung, especially the superior lobes, contributing but very little to the function. In a pathological condition, however, when the play of the lung is impeded by the presence of an effusion, the healthy lung comes into action in its whole extent, and nearly re-establishes the equilibrium in the phenomenon of hæmatosis. Dyspnœa is not one of the habitual symptoms of pleurisy with effusion. Pleural effusions, even when they reach 1800 grams or two litres, only accelerate the respiratory rhythm by four or five respirations per minute. This, however, does not apply to the painful period which is often accompanied by a false dyspnœa, and a reservation is made in regard to those cases in which fever is still vivid. But under all other circumstances, in the apyretic phase of pleurisy, and in subacute, latent, and chronic pleurisy, dyspnœa is a symptom so slight that it does not merit being taken into consideration, in reference to diagnosis, prognosis, or treatment. On the other hand, when a true dyspnœa is proved to exist during the course of a pleurisy, we must always be on our guard against a complication, whether the pleurisy be secondary (as in Bright's disease or affection of the heart), or whether it be associated with other phlegmasiæ or pulmonary congestion. (*Gaz. Hebdom.*, Sept. 27. *Med. Times and Gaz.*, Oct. 12, 1878.)

The Action of Cholalogues.—At a meeting of the Edinburgh Medico-Chirurgical Society Prof. Rutherford presented a summary of the conclusions he has arrived at from his experiments on the cholalogue action of remedies. These results have since been published *in extenso* in the *British Medical Journal*. The following are some of the most striking conclusions :—Croton oil, castor oil, gamboge, sulphate of magnesium, chloride of ammonium, sodium bicarbonate, potassium bicarbonate, menispermin (the resin of menispermin canadense), tannin, morphia, and iodide of potassium have no effect on the biliary secretion; aloes, rhubarb, senna, colchicum, taraxacum, scammony, leptandria (a new resin from leptandria virginica), jalap, sodium sulphate, potassium sulphate, Rochelle salts, chloride of sodium, jaborandi, physostigma, baptisin (a resin from baptisia tinctoria), phytolactin (from phytolacca decandra), and benzoic acid, are feeble cholalogues; while podophyllin, euonymin (a resin from euonymus atropurpurens), sanguinarin (from sanguinaria canadense), iridin (from iris versicolor), ipecacuan, colocynth, sodium phosphate, nitro-hydrochloric acid, sodium benzoate, ammonium benzoate, sodium silicylate, ammonium phosphate, and corrosive sublimate, are decided cholalogues. Hyoscyamus and acetate of lead lowered the secretion of bile without purgation, and calomel effects the same by purgation, or remains inert. Euonymin in doses of two grains, sanguinarin in doses of one quarter to one grain; iridin in doses of one to five grains; sodium benzoate and salicylate in doses up to a scruple, and ammonium phosphate seem to be the drugs best capable of increasing the secretion of bile. It in no sense detracts from the pharmacological value of these excellent researches if we express some doubt as to our knowledge of the clinical conditions under which it is desirable to produce an increased secretion of bile. The old notion of a cholalogue was one which increased the quantity of bile in the stools, an effect, no doubt in most cases, resulting from active purgation of the intestinal tract; and long experience has shown the value of remedies having this power in certain states of the digestive organs. It remains to be seen whether similar good will result in any and in what cases from the simple increased functional activity of the liver. It is highly probable that many of the phenomena of what is called biliousness, and which are assigned with more or less reason to hepatic torpor, depend more upon the diminution of the urea-forming functions of the gland than on the state of the biliary secretion. It is possible that these drugs stimulate equally all the hepatic functions, in which case their usefulness will find a large field. (*The Birmingham Medical Review*, Dec., 1878.)

Inhalation of Oxygen in Albuminuria.—Dr. Dujardin-Beaumetz inquired of his colleagues of the Société de Thérapeutique as to the results of their experience in treating albuminuria by means of oxygen. He related a case which had reached its last stage, all means having been tried in vain, when the respiration of oxygen was had recourse to. The albumin disappeared completely during the first twenty-four hours of its employment, and although this disappearance will probably prove only temporary, twelve days have passed without any return. Dr. Constantin Paul replied that he had published two analogous cases, in which, under the use of oxygen, the albumin disappeared, but in two months it returned as badly as ever. Similar cases have since been published, and the most that can be hoped for from these means is a comparatively long remission. M. Greletty observed that at Vichy it has long been the practice to administer oxygen both for diabetes and albuminuria, and as a general rule a diminution in the amount of albumin or sugar is observed; but the disappearance is not found to be total, and in all cases is only temporary. (*Med. Times and Gaz.*, Jan. 25th, 1879.)

Extracts from British and Foreign Journals.

The Various Applications of Calcium Phosphate in Medicine.—The works of M. Dusart have contributed largely to the spread of the use of phosphate of lime for therapeutic purposes. The importance of this substance is shown by the fact that phosphate of lime is in largest proportion in those animals whose activity is greatest, and whose temperature is highest. Phosphate of lime administered in an insoluble state passes along the alimentary tract, and is for the most part ejected with the fæces without causing any marked change in the animal economy. An entirely different action takes place, however, when the phosphate is dissolved in lactic acid. Under the form of lacto-phosphate, it stimulates the function of nutrition, whether in the adult or in the infant. In the latter under the influence of this substance the weight of the body undergoes a regular and progressive increase. Whilst exercising this general recouping influence, lacto-phosphate of lime exerts a special effect upon the osseous system, in which it causes an increase of hardness, or in cases of fracture, consolidation. This double action is the basis for the therapeutic applications of lacto-phosphate of lime. In rickets, M. Dusart finds that in every case in which the diet, though sufficient in quantity, was unsuited to the digestive organs, the addition of lacto-phosphate of lime caused rapid improvement. Very interesting observations upon this subject have been collected in the large hospitals of Paris. In wounds and fractures as in the preceding case lacto-phosphate of lime acts by its invigorating power and by its special action upon osseous tissue, to which it carries the calcareous salt or reparative material. Its employment is chiefly indicated according to Dr. Paquet in those cases in which there exist deeply-seated disturbances of the functions of nutrition. The result, which is all but constant, to be attained from this method of treatment is a marked diminution in the usual length of the period of consolidation. Easy pregnancy, constant appetite, a well developed and vigorous child, a rich milk and abundant supply, are the results obtained by M. Dusart from the employment of lacto-phosphate of lime by the mother. Given to the child it keeps up its appetite, favours nutrition, and thus preserves the infant from most of the ailments which are peculiar to the first period of life. In typhoid fever and its convalescent period, in albuminuria, phthisis, diphtheria, &c., the invigorating properties of lacto-phosphate of lime may be used with advantage. (*Gazette Médicale de Paris*, March 11th, 1879.)

Chrysophanic Acid in Diseases of the Skin.—Dr. Walter Smith sums up the knowledge that we have at present in the following words:—(1) Chrysophanic acid is a powerful local stimulant—not, however, tending towards vesication or ulceration. Its action in this capacity is best illustrated in psoriasis. (2) It also possesses undoubted parasiticide power. (3) It is a most efficient remedy in two parasitic affections—viz., ringworm of the body and tinea versicolor. (4) In ringworm of the scalp it frequently fails, owing to causes that militate against all remedies as yet tried. (5) In favus it has not as yet, so far as is known, had a trial. (6) As a destroyer of animal parasites its efficacy remains to be proved. It would probably be of service in some cases of scabies and in pedicularia. (7) Internally, as Dr. Ashburton Thompson has shown, it is an emetic purge. (8) Alizarin, a substance belonging to the same group of bodies as chrysophanic acid, upon several grounds appears to deserve a more extended trial in diseases of the skin. The acid is open to certain disadvantages now tolerably well known. Of these, the staining of the skin and dyeing of the hair are the least, for they quickly disappear when the use of the drug is suspended, and by simple precautions the discoloration of the patient's pillow, linen, &c., can be avoided; but the irritant qualities of the acid are more marked, and in more than one case Dr. Smith has been obliged to discontinue its use, even when fully diluted—20 grs. or less to ℥i.—on account of the œdema, irritation, and pain provoked by it. (*The Dublin Journal of Medical Science*, March, 1879.)

New Use of Belladonna.—We cannot too frequently direct the attention of the profession to the invaluable action of atropia or belladonna in night sweats, so prevalent and prostrating a symptom in cases of debility and of consumption. We have used it in the form of powders of atropia, $\frac{1}{60}$ grain with sugar, or $\frac{1}{4}$—$\frac{1}{2}$ grain solid extract in the form of pills, or 10—20 minims of the tincture, which is found to answer equally well. The following formula is almost a specific in phthisical cases with troublesome coughing:—

℞ Atropia sulph. . . . . grs. i.
Morphiæ sulph. . . . . grs. viij.
Acid sulph. aromat. . ʒij.
Aquæ menth pip. ad. . ℥i.
M. Dose, 5 drops thrice daily and at bedtime.

The morphine and acid may be omitted, and in sore throat, giving rise to coughing, nitric acid may be substituted for the sulphuric acid with advantage in five-drop doses. The tincture is being used with good results externally in night-sweating. (*The Canada Lancet,* vol. xi. No. 3.)

Protoxide of Nitrogen as an Anæsthetic.—It is a well-known fact that protoxide of nitrogen is generally used by dentists as an anæsthetic. It is employed by them in a chemically pure state. American surgeons have also made use of this gas in capital operations, but the operation cannot be continued uninterruptedly under its influence, as the inhalation of the gas has to be frequently suspended to prevent asphyxia, and sensibility returns as soon as the inhaling-bag is removed from the patient's mouth. M. Paul Bert, who has perseveringly endeavoured to obtain an anæsthetic which is at once harmless and efficacious, recommends that for pure protoxide of nitrogen should be substituted a mixture of protoxide and oxygen. This mixture should consist of eighty-five parts of protoxide of nitrogen and fifteen parts of oxygen. In this mixture a bird lived for forty-eight hours. M. Léon Labbé removed a nail whilst the patient was anæsthetised by means of this mixture, the pressure of the gas being at the time seventeen centimetres. The patient, a young woman of twenty, was readily brought under its influence, and did not pass through any excitable stage, presenting only a few passing phenomena of contraction. M. Labbé extirpated the nail without any movement on the part of the patient, who woke up almost directly after the removal of the gas, and was so far from suffering any feeling of depression that she walked away and called for food. The tension of the gas, made use of under a pressure of seventeen centimetres, was equivalent to 104. (*Le Progrès Medical,* Feb. 23, 1879.)

Ipecacuanha in Labour.—Dr. Carriger draws attention to the value of ipecacuanha in cases of rigid os uteri and perinæum; its power over uterine hæmorrhage beyond other hæmorrhages has been long known. He believes that it exercises a co-ordinating influence over that condition of the uterus in which we have irregular uterine action, and protracted, agonising, and inefficient pains. In cases of this kind it seldom failed to relieve the patient of much of her suffering, notwithstanding the evidences were very strong that the expulsive efforts of the womb were more than doubled, as indicated by the rapid changes in the circumstances of the labour. The drug takes effect in about thirty minutes after administration, yet the labour does not possess any of the characters of an ergotised labour, since the pains come at regular intervals, as in cases of natural labour, succeeded by intervals of rest. Whilst believing the dilating forces in these cases to be the stimulated, regularly recurring, forcibly expulsive, physiological force, Dr. Carriger does not feel prepared to say that ipecacuanha exercises no influence independently of its expulsive force. Its influence over the sick stomach of pregnancy might in whole or in part be due to some power of causing dilatation of a too-contracted os, as well as to its influence in diminishing the agonies of an irritable labour. Ipecacuanha is regarded as stimulant and restorative in the last stages of tuberculosis: and it was found to be useful in the latter stages of cholera. These facts seem to indicate a general contractility under its use of the non-striated or fibrous tissues, a contraction of the capillaries (as well as the uterine fibrous tissues), and thence a suppression of the colliquative sweats. (*The New York Medical Journal*, Nov., 1878.)

Iodoform in Eye Disease.—Dr. Hayes calls attention to the value of iodoform as a therapeutic agent in the treatment of certain subacute and chronic diseases affecting the eyes and eyelids. This remedy has been already in use for some time in cases of trachoma, or granular lids, with favourable results. The author recommends it for phlyctenular and pustular ophthalmia, corneal ulcerations, obstinate keratitis, ciliary blepharitis, &c., in cases of which he has used it with success. He crushes the crystals until they become reduced to a very fine powder, and then, with a delicate camel's-hair pencil, the powder is freely dusted over the affected surface. For use upon the eyelids such an ointment as the following will be found to be convenient:—Iodoform, one part; vaselin, four parts; mix. Iodoform when brought into contact with the eye does not give rise to pain, and children who have once experienced its effects will readily tolerate subsequent applications. It is, however, unsuited for the early or acute stage of conjunctivitis, in which, accordingly, it should not be used. (*Med. Times and Gazette*, Aug. 17, 1878.)

Tracheotomy without Tubes.—At the last session of the American Medical Association, Dr. Henry A. Martin, of Boston, made a practical suggestion in connection with tracheotomy worthy of notice. He regards tubes as entirely useless, and performs the operation in the following way:—The incision is made in the usual manner down to, and through the trachea; a central stitch is then introduced into each edge of the wound through the tissues, including the trachea; this is loosely tied so as to form a loop, through which a long strip of adhesive plaster is passed, and upon this very slight traction is made, the plaster being crossed at the back of the neck. Unless the traction be too strong the loops will not cut through for two or three weeks;

but he had generally been able to remove them in one week. The wound heals readily. He reported nine cases of this operation which had been found perfectly satisfactory in the hands of all who had tried it. Attention to the after-treatment, by properly regulated temperature and moisture, was insisted upon. (*The Dublin Journal of Med. Sci.*, Sept., 1878.)

Cerebral Hæmorrhage from the Prolonged Use of Potassium Iodide.—M. Hallopeau cites the case of a person who took a daily dose of 6—10 grams of iodide of potassium for a period of six months to cure himself of syphilis. From the ingestion of this quantity of the drug patches of purpura occurred on his lower limbs, and at a later period a slight deafness and hemiplegia of the left side. The symptoms came on rapidly, and the patient was quickly and permanently cured; the hypothesis of cerebral syphilis being therefore excluded, whilst that of cerebral hæmorrhage from the excessive ingestion of iodide of potassium was favoured. The result is to be attributed to the iodine, possibly to the iodates, but not to the potassium salt, although it proves that large doses of bromide of potassium may be absorbed. (*Le Praticien,* Jan. 13, 1879.)

Glycerin in Phthisis.—Glycerin in small doses acts, according to Catillon, favourably on nutrition, causing increase in weight; the tissue metabolism is lessened, and the elimination of urea is decreased to about one-third. In general 15—30 gr. is a sufficient dose. Glycerin may be given as a substitute for cod-liver oil; or in combination with other remedies. Frémy prescribes a mixture of the purest glycerin, giving no acid reaction, with syrup fer. jod. about 50·0, and syrup morph. (Ph. gall.) 100·0; dose 1—2 teaspoonfuls daily. De Boyer orders it with creosote, creosot. pur. 2 gr.: glycer. p. 60 gr., syr. rhub. id. 120 gr., essence menth. pip. 20 gtt. Each teaspoonful contains 20 cg. of creosote and 6 gr. of glycerin. 2—4 to be taken daily in a glass of ordinary or aërated water. (*L'Abeille Med.*, 1878—*Der practische Arzt*, Sept., 1878.)

Boracic Acid in Skin Diseases.—Professor Neumann, who has for some years past made great use of borax ointment, has recently endeavoured to bring boracic acid into use in the treatment of diseases of the skin. He prescribes an aqueous solution in parasitic diseases; an alcoholic in the itching consequent upon urticaria, and pruritus; the ointment in all forms of eczema. Combined treatment with soapwash and tar is necessary in infiltrated forms of eczema. Aqueous and alcoholic solutions are applied by means of a sponge or brush, or the remedy is dusted over as a powder. In pityrasis and herpes tonsurans solutions of 10—20 : 300 with the addition of 2·5—3·0 oil of cloves; in eczema a salve of 10 : 50. An infusion of cloves may be added to the alcoholic extract. (*Der practische Arzt*, July, 1878.)

The Treatment of Phthisis.—Creosote has of late been highly recommended by French physicians. The formula in use at the present time is as follows: creosote 3·50; alcohol or water about 125·0. A teaspoonful of this mixture to be given twice a day. The action of the remedy is as follows: (1) The expectoration is lessened, and the sputa is more mucous in character. This result is obtained in from 8—14 days, and is generally followed by a decrease in the cough. (2) Decrease of the cough, which becomes less, the evening cough being first improved, or altogether disappearing, then the morning attack; and lastly, those which occur during the day. The cough is frequently improved before any change takes place in the expectoration. (3) The appetite is increased, and the vomiting, when present, subsides. (4) There is a diminution of fever followed by complete cessation. (5) Decrease and entire disappearance of the nocturnal sweatings, occurring about three weeks after the adoption of this method of treatment, though it may not take place for two or three months in phthisical patients in an advanced stage of the disease. (6) Marked improvement in the physical signs, in relation to the fluid in the bronchial tubes, and to the induration or thickening of the lung tissue. (7) Improvement in the general condition and a return of strength. (8) Gradual but appreciable increase of the body weight. (*Allgem. Centralztng.*, No 45.)

Temperature in Disease as a Diagnostic and Prognostic.—In a normal state the temperature of the body taken in the axilla is 37·2°—37·5° C. If the temperature increases regularly, rapidly, and constantly, without cessation or fall, the disease is an eruptive or intermittent fever, or pneumonia, provided that the rise continues for some hours, or even for a day and a half. If the temperature increases for some hours—to 41° for instance—and then falls again about the fifth or sixth hour to the normal, the fever is intermittent. In pneumonia the temperature rises regularly, and remains from the third to the sixth day between 39·5° and 40°; a rapid defervescence takes place about the sixth day, when the temperature regains the normal. Should however the case be fatal, the high temperature will be permanent. In like manner, scarlatina, measles, and true smallpox, as well as erysipelas, are each characterised by special peculiarities of temperature. If the temperature increases gradually, but in a regular manner for five to nine days, presenting a morning decrease, the case is one of typhoid fever. Meningitis, although accompanied by a somewhat similar rise, is differentiated by the pulse remaining slow. Should the temperature rise gradually but irregularly, and should the rise be intermittent, the disease is probably one with an irregular cycle, such as rheumatism of the joints, inflammation of the pleura or of the pericardium. From a prognostic point of view the increase in temperature has a dangerous import when it is continuous for some length of time, or when it reaches 41·5°, 42°, or even 42·8°; cases have however been cited in which the temperature rose to 45° and even 50° (!) without causing death. The temperature generally rises considerably at the instant of death, except in cases of chronic consumption; it may even continue to rise after death for an hour or two; this generally occurs in variola (death occurring during the early stages), cholera, and in fracture of the skull without external wound. (*Le Praticien*, Jan. 13, 1879.)

Veratrum Viride in Epileptic Convulsions.—Dr. Mordough finds in veratrum viride an agent for diminishing the severity and decreasing the frequency of the recurring convulsions. The solution, which was used hypodermically, was entirely satisfactory, and was followed by no unpleasant results, the small amount of morphia counteracting in almost every instance the nauseous and emetic effect of the drug.

℞. Morphiæ sulphat: gr. ijss.
Tr. veratri virid.
Aq. dist. āā ℥ss. Misce.

The veratrum was given subcutaneously in nine cases, in doses of 18—22♏, and although the convulsions had been increasing in severity, or at least were not becoming less severe, no convulsion followed its administration. In one case in which the drug was given by the mouth, but one convulsion followed, and that was shorter in duration than the previous ones. Emesis was only established in one instance, and was promptly controlled by morphia. As far as could be ascertained, the injections were not followed by abscesses, and but little local pain was experienced. In conclusion, the author believes that veratrum viride administered in large doses of ten to fifteen minims of the U.S.P. tincture, will in almost every case abort the recurring convulsions of epilepsy, and that used in such doses no unpleasant results will be experienced. (*The New York Medical Record*, Sept. 16th, 1878.)

Reflex Symptoms in Hip-joint Disease.—Dr. Bradford, of Boston, has examined a large number of cases of hip disease with regard to the following reflex symptoms: stiffness or limited motion, muscular contraction, muscular irritability and diminution in electro-muscular contractility. He writes of the first-named of these symptoms, "Stiffness or limited motion of the hip-joint may rarely be wanting at the very commencement of hip disease, contrary to what has been taught.

"The symptom is, however, an early and constant one; much more so than the presence of pain or tenderness. This limited motion may be so slight as to be only detected by the exercise of great care, or may be enough to cause complete stiffness of the joint. The amount depends probably upon the activity and duration of the process.

"The symptom is also seen in other diseases of the hip-joint.

"In certain affections about the joint, but not involving it in muscular contractions from various causes, there may be limitation to motion. This symptom is not an early one, and differs from the resistance encountered in the early stage of hip disease. In hip disease the motion of the thigh is limited both in flexing and in extending to an equal degree. In affections not involving the joint the limitation to motion is not so uniform; flexion may be possible to the usual amount, while the motion of extension may be absent.

"Resistance to motion to an equal degree in all directions is highly characteristic of a joint affection."

As aids to diagnosis the other reflex symptoms are not of great value. But the evidence as to motion in the joint the author considers of great importance, as may be inferred from the concluding sentences of his paper.

"Mistakes in the diagnosis of hip disease are unfortunately not uncommon. The results of such mistakes are deplorable.

"It has been said that every case of hip disease passes through a stage when it is what is called 'rheumatism.' It is precisely at this stage that a diagnosis should be made.

"Cases are not unfrequently seen where a diagnosis of incipient hip disease is made, although the disease has progressed so far that suppuration of the joint is imminent, it being apparently the opinion of some that hip disease is not present until grating can be felt on manipulating the joint under an anæsthetic, or, in other words, until the disease has progressed to a dangerous extent. The liability to error will be less if the following facts be kept in mind:—

"1. Serious disease at the hip-joint may exist when no pain is complained of, and when no tenderness can be discovered.

"2. Hip-disease may be present although the motion at the hip-joint is quite free.

"3. If the motion at one hip-joint is more limited than at the other, hip-disease must always be suspected, and the symptom regarded as highly characteristic of hip-disease.

"4. At the earliest stage, the limitation of motion most readily recognised is in the direction of extension." (*Trans. of Massachusetts Med. Society*, 1878.)

Hygiene of Sight.—M. Javal explains the chief results at which he has arrived from statistics obtained from a number of children in relation to variation in the sense of sight. When the sight is in any degree imperfect, M. Javal finds, that astigmatism is the cause, since the sight can be restored to the normal condition by correcting the astigmatism. At the Monge school where the light is exceptionally good, M. Javal finds that ten per cent. of the pupils suffer from astigmatism, although in many cases doubtless the children suffered from the disease before they commenced their school life. The author then discusses some of the causes of this deterioration of sight; he shows that books printed upon toned paper do not cause so much fatigue as when printed on ordinary white paper. In correcting for sight, he says, allowance has nearly always to be made for chromatic aberration, and this is done by the use of a monochromatic light. It is necessary, however, to prevent as little of the light as possible from reaching the eye, and to effect this the colours from one or the other extremity of the spectrum should be alone removed. If the red end is suppressed too much light is at the same time removed; and it is much better to absorb the blue and violet rays, the resulting colour being a yellowish grey, and in this fact is found the true reason for the superiority of a grey paper for books. (*Le Progrès Médical*, March 1, 1879).

Vertebral Torsion.—M. Jules Guerin considers the mechanism of vertebral torsion in relation to its influence upon the formation of the anatomical characters in lateral curvature of the spine. Torsion he finds to be a constant and ordinary concomitant of lateral deviations of the vertebral column, being related to the phenomena of the curve, whatever may be its position and direction. Torsion is the effect of the four varieties of influence which render the vertebral column strongest in its transverse direction, viz., its osseous nature, the passive resistance of the muscles, their occasional and their permanent contraction. As a result of these influences, the vertebral column is in the condition of a board which has been bent along a ridge, or along the line of greatest resistance, and which has (to escape from such an impossible position) undergone a movement of torsion, such as to cause it to present its surface of least resistance to the force of flexion. As a result of the growth of the agents of this lateral resistance from the centre of the vertebra to the extremity of its vertebral apophysis, the torsion of the spine does not take place round the axis of the column, but round an axis passing through the centre of the vertebral apophysis. From this arrangement and mechanism it follows that the vertebral curves are always more decided in front than behind, or in other words along the line of the bodies of the vertebral rather than along the line of the spinous processes, and that from their first commencement, the curves described by the bodies of the vertebra already measure 15 mm. in vertical height, even when the summits of the spinous processes are still forming a straight line, and increase correspondingly. The torsion is the chief factor in the anatomical characters of lateral curvature, it betrays itself below by the displacement that it occasions in the accessory parts of the column, and of the parts which it conveys. The special character of these displacements resolves itself into the projection posteriorly and the depression anteriorly of the parts corresponding to the convexity of the curvatures, and reciprocally into the depression posteriorly and the projection anteriorly of the parts corresponding to their concavity, from whence the two anterior and posterior projections of those persons who are affected with considerable lateral deviation. (*Ibid,* March 8, 1879.)

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⁂ Any of the foreign works may be procured on application to Messrs. DULAU, of Soho Square, W.C.; WILLIAMS and NORGATE, of Henrietta Street, Covent Garden, W.C.; or BALLIÈRE, of King William Street, Charing Cross.

Department of Public Health.

IS THERE REALLY ANY IMMINENT PERIL OF AN EXTENSION OF THE PLAGUE IN EUROPE.?

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If any question deserves to be called a question of the day, it is certainly the plague question, at present exciting both the minds and the pens of so many people. The following treatise contains a reproduction of some articles, which at the end of February were published in a highly reputed Danish paper.

Though I feel rather disinclined to discuss scientific and especially hygienic matters in the general press, I have nevertheless, partly as the medical officer of health of the city (Copenhagen) and partly on account of the subject itself, found myself bound to do so. It must be granted that there is less occasion now to raise the question, the whole plague-panic being probably *à retour*, and soon perhaps quite forgotten; but as my excuse for bringing this matter before the public, I must allege the circumstance of my considering it necessary that a man of intimate knowledge with the subject should treat it in the general press.

The reason I dislike to treat hygienic measures and questions in the general press, is, that I know by experience, that so many erroneous views concerning this subject are in circulation, that only a very prolix discussion—and even that difficult enough—will set right both physicians and laymen. Every practitioner considers himself skilful in hygiene and fit to advise and instruct the sanitary authorities, while the fact is, that Denmark, for instance, at the most possesses only three or four physicians, who have made a thorough study of hygiene and have had occasion to control the theories by their own experience. In the country you will generally find a much sounder view of hygiene than in towns and cities, where, on the contrary, a greater clinical experience in the treatment of the sick is to be found.

The majority of practitioners do not keep in mind the peculiar sense of every hygienic measure, viz., to operate on a large scale and upon the great body of the people, and still less the difficulties with which the very execution of this sort of measure so often meets. In this respect I need only mention how often too rigorous quarantine measures, especially the blocking up of boundaries, have not only been totally illusive but sometimes perhaps even injurious. By long experience I have come to the result that proposals in this respect, and a criticism thereof, must be made with the utmost caution. On account of the present very uncertain scientific basis of the hygiene, we are often brought to doubt the use, nay, even the necessity of the proposals we have to put forth.

The above statement holds good especially as far as pestilential and other dangerous epidemical diseases are concerned. Every one who has studied the science of hygiene has arrived at the conclusion that it is not only important to keep these diseases from the frontier, or to prevent their approach to the densely populated centres, especially the larger seaports, by suitable quarantine provisions, but that the main point is also to meet epidemical diseases with rational isolating measures, either in order to cut off a commencing epidemic or at all events to prevent its further extension—in which we have succeeded several times in this very city since 1865. The contrary view would be to admit that hygiene was a great lie.

In the dangerous epidemical diseases there is however another subordinate circumstance, which every intelligent physician will take into consideration, viz., the panic, so easily raised under these conditions, and which causes irreparable harm in so many points, and with respect to the further extension of the epidemic doubtless is a very dangerous disposing cause. Any one who has been obliged to combat epidemics can speak from experience in this respect, and I for my part have now and then had so sad an experience, that I was forced to give up all measures.

It was scarcely to be expected that the plague panic,—which has been raised in Germany, Austria, and Roumania, and since then with such an incredible rapidity, almost like an avalanche, has spread over nearly all Europe,—should entirely have spared our little country. But as we inhabitants of the northern countries are generally considered rather phlegmatic and able to meet imminent perils with a certain cool and quiet reflection, it might have been hoped that our capital would not have been infected so speedily by the nervous excitement which has appeared at so many other places. I am sorry to say that this hope has not been fulfilled, and the best proof of this is that a journal otherwise so well instructed as the Copenhagen paper, *Dagbladet*, in its No. of Monday 27th February, published a very alarming article " On the Plague and Plague Epidemics," written by a professor at our university, not indeed of epidemiology and hygiene, but of pathological anatomy. In contrast with this loose and, in many respects, incorrect article, it becomes quite a relief to be made acquainted with the information contained in the appendix of the *Weekly Bulletin* of February 3rd published by the *Kaiserlich Deutschen Gesundheitsamtes*, established a few years ago in Berlin.

One of the most significant points discussed in the above-mentioned *Weekly Bulletin* of the German Board of Health, and which has been quite clear to every epidemiologist who is thoroughly conversant with the course of epidemical diseases, is that of late epidemical plague has reigned at intervals in Mesopotamia, Kurdistan, and Persia, for the last ten years nearly annually, and that in spite of the unusually frequent intercourse which takes place between these countries and Russian Caucasia, such an uncommon event as the war between Russia and Turkey was wanted to convey the pestilence from Kurdistan and Persia to the valley of the Volga. Nearly everybody agrees in the opinion that the plague at the present time reigning in Russia has its origin from Persia; but it is perhaps rather doubtful that it has been imported by sea from Rescht to Astrachan, as Professor Hirsch seems inclined to suppose, though that statement is in accordance with the fact that the disease generally travels by sea, or, that the supposition entertained by several Russian and Austrian physicians should have more ground, viz., that by the unusual gathering and dispersing of troops the plague has made its way—in this case by land—to Russia.

The significance of the above elicited point consists in the fact that the Asiatic plague has been ten years getting to Europe. The general opinion seems to be the same, as appears by various English statements, as to the plague which reigns on the Himalaya mountains being the common Egyptian plague, while the disease south of Himalaya is supposed to be the so-called Pali plague—but this distinction seems to me somewhat strange. Later on I shall return to this sophistical scientific question.

The next point of special importance which has been put before us in the above-mentioned paper is that the first cases of this disease appearing in the southern part of the valley of the Volga had been noticed in May 1877; and no one raises any doubt whatever of its having been brought thither from Persia. However, as is generally observed with the like epidemics, these first cases were peculiarly mild and at the most resembled the worst forms of typhoid fever, just as it is stated in the accounts bearing on the cases of the first outbreak of the Plague in Bengazi in 1858 and in the epidemic of 1874 (cfr. Dr. L. Arnaud, *Essai sur la Peste de Bengazi,* Constantinople, 1875). Thus, as to its character and way of propagation the Asiatic plague seems to follow the same rules as the Egyptian and the like pestilential diseases. It resembles them by appearing in the commencement in a very mild form, which easily deceives the physician, and in developing itself by and by into a more serious or even murderous epidemic. This takes place by the co-operation of a great number of unstable hygienic conditions, which essentially belong to the East and of which we Europeans can form no proper conception. The Volga or rather the Astrachan plague has thus nearly taken one year and a half to attain the height and malignity of the present time.

Here I must be allowed to draw attention to a point which I believe has been rather disregarded in the general panic. Dare we say for certain that at this present time an invasion of the plague has taken place in Europe? As for me, I believe I can claim a right to deny it. The tribes inhabiting the valley of the Volga consist, as we know, principally of Kirghiseans, Kalmucks, and Cossacks. The Kalmucks are originally a Mongolian or

Siberian tribe, most of whom follow the Buddhistical and Mahomedan customs, but many of them are Christians. The Kirghiseans are a wandering tribe and have come for the most part from Russian Asia; they live in districts only partly bordering on Europe. Lastly the Cossacks, who are intermixed with Russian Tartarian and Kalmuckian elements, but who mostly must be considered Asiatics, live in wretched hovels along the Volga in an atmosphere of dirt and filth which almost surpasses every conception. The greater part of these miserable huts and villages belong to the Asiatic side of the Volga, whereas the smaller part belong to the European side. The German paper referred to admits that the plague district is very limited; moreover, that at Astrachan the Volga is not free from ice till March 25th and at Saratov not till April 19th; and furthermore it is added that according to the statements which are hitherto given, not one single case of the real plague has taken place in any of the ports on the Sea of Asov and on the Black Sea. Therefore one must indeed wonder at the precautions that have been taken in so many places under influence of the panic raised; precautions which according to my view of the matter are not easily to be approved of when criticised by sober-minded people. We see that most of the governments of Europe acting under great pressure have already declared the ports of the Sea of Asov and of the Black Sea suspected of plague, but this is not quite correct in the strict sense of quarantine. It may moreover be remembered that our government has been blamed for having delayed the decision of this question till we had gained more accurate information from Holland and Belgium; but this resolution was after my advice approved of by the Minister of Justice, to whose jurisdiction the Board of Health belongs. This has furthermore proved to be a judicious decision, for it appears from a telegram which I received from my friend, Dr. van Cappelle, the Director of the Board of Health in North Holland, that the cautious Dutchmen have done nothing more in the way of quarantine than to put in action their new law of quarantine of March 28th, 1877,—which, however, is no regular law of quarantine but a law analogous to our own of May 1st, 1868, equivalent to the so-called system of revision or inspection. In Belgium a kind of quarantine of observation has been ordained, but the details of which have not yet come to my knowledge. Lastly, in Norway the law of quarantine of July 12th, 1848, which still holds good, has been put in force; however, it is worth notice, that this law is not so draconical as our own antiquated law of quarantine of February 8th, 1805, which possesses the peculiarity of classing certain quadrupeds and birds among "pestiferous" articles.

As far as I can judge, having studied carefully the course taken by the Astrachan epidemic, I can come to no other conclusion than that this malady has no disposition whatever to spread south-west towards Europe but on the contrary in the north-east direction into Asia. The only doubtful point is the immediate vicinity of the Don for steamers as far up as Zarizin. Thus, considering all the circumstances at issue put together, it appears to me, that people ought very soon to come to a clear understanding of the fact that there is something exceedingly uncalled for and exaggerated in the present fear; yet one cannot help admitting at the same time the difficulty of keeping moderate during a panic caused by rumours of the plague.

I do not hesitate in putting forth the remark that in the plague epidemic in Bengazi, 1874, there was far greater reason to fear an invasion of the plague in Europe; the same was also the case last spring with the approaching large concentration and dispersion of troops in America. In a letter addressed to me, by Mr. Barner, Director of our Board of Quarantine, he expressed his anxiety of the numerous cases of typhoid [typhus] fever which have been put down in my "weekly return" for St. Petersburg. On the ground of my above-mentioned opinion, I then stated the true situation of the different camps and military hospitals at the Armenian seat of war and advised the Board to apply to the Ministry of Justice with the request to have the provisions of the law of May 1st, 1868, put in force as to the exanthematic typhoid [typhus] fever in vessels from St. Petersburg and Kronstadt, which was accordingly approved of.

Though naturally it was out of the question to put the law of May 1st, 1868, in force against other diseases and harbours than those which at that moment were concerned, *i.e.*, Kronstadt and St. Petersburg, where the exanthematic fever then raged, I must confess that I had taken both plague and dysentery into consideration also. Dysentery especially prevailed in a very contagious form among the Russian as well as the Turkish soldiers, and shortly before that time the city of Copenhagen was attacked with a small but very contagious epidemic of that disease, which nevertheless had been successfully cut short. From earlier experience concerning this epidemic, especially from the frequent epidemics in Schleswig, where for ten years I acted as a medical superintending inspector, I had gathered that it was exclusively due to fresh contagion either from tropical or sub-tropical countries or conveyed thither indirectly from the seat of war. I was moreover well acquainted with the excellent description of the extension of this disease by contagion (by the Norwegian Physician, E. Homan, Christiania, 1860), and I felt reassured that our modified law of quarantine, if put in force, would make us capable of keeping watch also in that direction. That at the time mentioned there was a question of a possible invasion of the plague in Europe, I had so much the more reason to suppose, as the renowned Professor of Epidemics, A. Hirsch, two years previous to this, in the German Hygienic Society in Berlin, had brought the question into discussion: "What has Europe to fear at this immediate period from the Oriental Plague?" (conf. *Deutsche Vierteljahrsschrift für öffentliche Gesundheitspflege*," 8 Band, 1876, p. 377).[1] This interesting lecture which, among other things, contains a complete account of the recurring outbreaks of plague in Persia, Mesopotamia, and Africa after 1858, was of so much the greater interest as it appeared to me that Mr. A. Hirsch in some points had deviated a little from his previously stated opinions in his well-known *Handbuch der historisch-geographischen Pathologie*, where he is not in accord, in my view erroneously, with French writers on plague-epidemics (conf. my notice of this matter in the memorandum delivered to the Congress in Vienna: "*L'apparition du Choléra en Danemarc depuis sa première Invasion en Europe, comparée avec l'Apparition de la Maladie dans les Pays limitrophes et les Ports voisins.*" Vienne, 1874.)

Though I am not altogether a stranger to the fact that the precautions which last spring were taken by our Commission of Quarantine against the exanthematic typhoid [typhus] fever, were considered by some people exaggerated, and perhaps even may have caused a little diplomatic resentment on the part of Russia. However, it is at least evident from this that the medical officer of health of Copenhagen has been on his guard.

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[1] [See *Practitioner*, vol. ii. 1877, p. 223, for a translation of this paper.]

I shall now proceed to inquire as briefly as possible into the intricate question what sort of plague is spoken of in this case, though I fear to tire my readers by the minute details I shall have to put forth. My first observation must be to assert that, according to my apprehension, the so-called "Black Plague" is quite out of the question here. The name of this malady, of which we possess the most copious accounts, is in itself sufficient to act on the imagination and cause a great panic. The "Black Plague" as it is called, came, as far as we know, from China, and according to the detailed statements mentioned, it must be looked upon as originating in a convulsion of the earth, to which all the eastern part of the globe was subject[1]—(at that period America was still unknown to us). As it was a solitary event in the history of the world, it was undoubtedly connected with some phase of the development of the earth, with atmospheric peculiarities, followed by social calamities, which spread over vast areas of the then known part of the world (cfr. especially the detailed account of the telluric commotion in Hecker, p. 34 and following). These peculiar terrestrial and climatic phenomena appeared first in China thirteen years before the outbreak of the plague there, and fifteen years previous to its appearance in Europe. They are described as most remarkable, namely, the falling in of mountains, inundations followed by famine, etc., etc. In the year 1346–47 some thirteen millions of men are said to have become victims to this form of plague. Also in Europe the outbreak of this disease was preceded by earthquakes, inundations, and the most strange climatic changes, but they did not take place till 1348. At some places inundations like that at the time of Deukalion are spoken of; and at different places in Germany, in Cologne for instance, people sailed in boats over the walls round the town; and the same was the case in Würtzburg, Frankfurt, Dresden, etc. This plague must have had its origin in China, according to the facts at issue, and not in India, as some people would believe, on account of its casual resemblance in a single pathologic point to the so-called Indian plague. It poured out from China by different routes over India, Europe, Syria, Arabia, and Africa, and in the end found its way to the respective ports and sea-towns.

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[1] These remarks are chiefly grounded on the interesting relation by Hecker :— *Die grossen Volkskrankheiten des Mittelalters.* Gesammelt u. s. w. von Dr. A. Hirsch. Berlin, 1865,—which appeared later, and in some respects differs, from his manual of 1860.

This peculiar form of plague, which, with its complication with inflammation of the lungs, has been described with great precision, in spite of the incomplete diagnostic means then at hand, cannot at all, according to my view, be identified with the plague in Astrachan. When therefore at the meeting of the International Board of Health in Constantinople, January 28th this year, the British Deputy (no doubt Dr. Dickson, physician to the British Embassy,) considered it necessary to allude to the great analogy between this disease and the Astrachan plague, having previously given an historical sketch of the plague in China,—I cannot help remarking that it appears to me that his analogy was completely confuted by Dr. Bartoletti, the skilful Medical Director-General of Turkey. Dr. Bartoletti was by a combination of dates able distinctly to show that the present Astrachan plague originated in Persia (Armenia); and in this point he was backed by the authority of Mr. Hirsch and several other physicians.

The circumstance that most of the epidemiologists now agree in this point that the Astrachan plague has not its home in China, is of special moment, as it is impossible to designate it any longer by the alarming appellation of "the Black Plague." In a lecture which Dr. A. Hirsch lately gave at Berlin, he also expressed himself with great caution, only speaking of "the Asiatic plague."[1]

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[1] As far as the plague in Persia and Asia Minor is concerned, of which I possess several very copious accounts, I have to remark that the Persian plague especially must without doubt be considered to have a special connection with the system of burial in the East, and with a kind of cadaverous putrid infection thence arising —such as the French writers have justly observed of the Egyptian Bubonic plague. Dr. Polak, the Persian Deputy at the Congress at Vienna, expressed himself strongly in favour of this view (comp. for the rest his interesting book of travels: *Persia, das Land und seine Bewohner*, 1865). Among other reports I shall quote one of Castaldi, *La Peste dans l'Irak-Arabi*, Constantinople, 1875, from

What form of plague the so-called Indian or Pali plague, sometimes also denominated "the Black Plague," may be, is at the present time a very irrelevant question, tending to alarm people, and which I think ought to be confined to the intimate study of scientific men. It is a very idle occupation now to inquire whether the disease, the Máhámari, which at intervals appears on the Himalaya mountains and which is described by English physicians as similar to the Egyptian Bubonic plague, is the same that principally infects the valleys, especially on the southern decline of the Himalaya, and is said to have one point in common with the plague in China, that of appearing together with inflammation of the lungs.[1]

On this occasion I cannot refrain from mentioning a leading article in the English medical journal *The Lancet* for January 11th this year, in which the quarantine precautions of the Russians are ridiculed in the strongest terms. The article puts me in mind of an expression of John Simon, most likely uttered a long time ago, by which he denominated contrivances in the way of quarantine as "paper-plausibilities." The same journal with reference to a memorandum on the plague by J. Netten Radcliffe, lately published, returns in a later number to the same theme, and speaks of the measures taken by Russia, Germany, and Austro-Hungary in the strongest terms of disapproval.

The strong language which this highly esteemed journal makes use of, gives me the opportunity of reminding the Editor of the fact, that England (*i.e.* the now deceased General Board of Health) in 1849 published an ominous "blue-book" on quarantine, by which it really succeeded in making many European States adopt a miasmatic view of the matter and completely do away with the quarantine against the cholera. Since then sad experience has taught many countries that cholera was indeed a contagious disease, and especially that ventilation,

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which we learn that in one year (1873) 12,000 bodies in a more or less putrid state were conveyed to the holy places of Nedjeff and Kerbellah—not to be interred, but to be deposited in cellars and vaults of vast dimensions, in the vicinity of the holy mosques. The notes of the Turkish Commission are of especial interest.

[1] For the rest the Himalaya mountains are considered, by English physicians in India, very healthy to live in, and are recommended as "a health resort" for the English soldiers and government officers.

contrivances in the way of cleanliness, good drinking-water, etc., (the so-called passive hygiene) are quite insufficient measures to prevent a threatening epidemic; and Europe will surely not suffer herself to be led astray once more. No sensible physician moreover ever dreams of denying the excellence of the common hygiene under ordinary and peaceful circumstances.[1]

The General Board of Health died a natural death. It was to a great extent influenced by architects and engineers who did their best to make the English medical world believe, that if they had only sewers and drains, a sufficient and good water supply, effective ventilators, etc., etc., they were quite safe against the influence of epidemic diseases. John Simon, the practical man, who succeeded this Board of theoretical men, has the honour of having done away with the ruinous passiveness in the above-mentioned respect. To this eminent hygienist—the intimate acquaintance of whom I have enjoyed for several years—it is due, that so many sanitary reforms were introduced, in respect to vaccination, erection of epidemic hospitals, stricter measures against the cholera, etc., etc. I question whether the eminent epidemiologists in England, among others Dr. W. Budd, Dr. Robert Lawson, Dr. Macnamara, Dr. Macpherson, Dr. John Murray, lately Surgeon-General of the English troops in India, or the present medical officer of the Local Government Board, Dr. Seaton, are disposed to agree generally with the late General Board of Health in its views and especially respecting cholera as a mere miasmatic disease. The above-named Dr. John Murray seems especially not to embrace the hypotheses of Pettenkofer, but rather inclines to the views of the French hygienists, for instance to those of Dr. A. Fauvel as regards the disease. On the other side I understand very well that the theories of Pettenkofer,—dictated by an eminent chemist who, however, unfortunately, is not a physician, and perhaps never has seen, much less treated, a cholera patient, consequently is perfectly devoid of the physiological erudition so necessary in order to understand the significance of contagion,—still must have high reputation in England. The same seems to be the case in India among the English physicians residing; Dr. Cornish, however, Sanitary Commissioner of Madras, forming an exception in that respect. These views, which for such a long time have infatuated so many physicians, but fortunately even in Germany itself are beginning to lose ground, I consider not only quite incorrect but even very noxious.[1]

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[1] That Denmark has given sufficient proofs of her being fully aware of the necessity of hygienic precautions under ordinary circumstances was proved at "Le Congrès international d'Hygiène, de Sauvetage et d'Économie sociale à Bruxelles, 1876." The commission formed for that special purpose was able to exhibit thirty-eight pamphlets and tracts, mostly elaborated by public authorities, but also by several private physicians and professors of hygiene, for instance a treatise by Dr. Cold, *Observation nosographique de la Pratique rurale;* by Professor Stadfelt, *Les Maternitées, leur Organisation et leur Administration*; Dr. P. A. Schleisner, *Exposé statistique de l'Organisation des Hôpitaux civiles en Danemarc;* Dr. Hornemann, *Citées ouvrières en Danemarc;* Dr. Krabbe, *Notices sur la Cuisson dans le Foin;* Professor Falbe-Hansen, *Représentations cartographiques des Institutions danoises de Prévoyance;* Knudsen, *Exposé statistique des Institutions et Sociétés danoises philanthropiques*, &c., &c.

Thus I still adhere to my before-mentioned opinion as regards the small probability of the present Astrachan plague extending itself further over Europe, as well as to the point that we must make a strict distinction between that disease and the "Black Plague,"—even quite leaving out the question of the relation between the China and the Pali plague. I am inclined to consider an invasion of the cholera just as great a misfortune as an invasion of the plague, because I look on the former disease as a far more deceitful epidemic.

As to the panic in Germany and Austria which has given rise to very different opinions, the most natural explanation is perhaps that it was principally caused by the different opinions of the physicians on the plague-commission, some of them being disposed to extreme precautions, whereas the epidemiologist, Dr. A. Hirsch, seems to have taken a very sober view of the matter. This appears more plainly from a lecture delivered by Dr. Hirsch at Berlin at the end of January, of which most of the papers have given a short extract. This lecture was the cause of my immediately referring myself to my honoured colleague. The disposition so to do was so much the greater as we had already before exchanged opinions concerning hygienic matters; moreover, I know from my stay at Vienna during the cholera-congress, held there in 1874, that Dr. Hirsch valued the epidemiological statements of the Danish physicians and had in the medical society at Berlin in 1871 given a lecture on the "Copenhagen Regulations against the Cholera," worked out by me.[1]

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[1] Comp. the elocution which Mr. John Woodworth, Supervising Surgeon-General at Washington, gave at the Exhibition at Philadelphia in 1876, of the precautions taken in America against the invasion of the cholera, from which we learn that the practical Americans seem to be perfectly regardless of Mr. M. v. Pettenkofer's theories and hypotheses.

This became of special importance at the congress mentioned, since "the Copenhagen Cholera Regulations" for the most part were made the foundation of that complex series of precautions which were approved of as to sea quarantine against the cholera, while the majority of the delegates were against all blocking up by "cordons" as "inexecutables et inutiles."[2]

I therefore have reason to regret that this system was not named, as it ought to have been, "The Danish or Copenhagen Regulations against Cholera," but was called "A System of Revision," which I hold to be an incorrect title, and which has given rise to diverse misunderstandings. Thus, for instance, the deputies who spoke in favour of more rigorous precautions, the delegates from Spain, Portugal, Greece, Turkey, Egypt, and especially the French medical representative, Dr. A. Fauvel, the Inspector-General of the Civil Board of Health, misled by this incorrect denomination, have hitherto refused to approve of the above-named system.

It must, however, be remarked that this system, in the manner in which it has been executed by us in accordance with the now existing law of May 1st, 1868, "Law respecting the measures for preventing the introduction of the Asiatic Cholera by sea," must be acknowledged to be founded on modified and very moderate quarantine precautions;—and the experience of twenty years has shown us that it can protect us thoroughly against the invasion of cholera. The same experience has been obtained in Norway.

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[1] Comp. an article in that respect in the *British and Foreign Medical and Chirurgical Review*, October, 1871, entitled "The Cholera in Copenhagen, 1866," addressed to Dr. W. Moore in Dublin.

[2] It must be taken into consideration that the Cholera Congress at Vienna, 1874, cannot be classed with the usual meetings of medical men, on account of its consisting of a very limited number, of about thirty physicians, conversant with the subject, all of whom (with the exception of Dr. Pettenkofer, the chemist) were more or less experienced in treating and preventing epidemics. Where the diplomatic agents were not present, these men had, moreover, a sort of diplomatic mission, and in a way the right to make the respective states enter into common international and sanitary agreement. I will not here enter into a discussion of the fact that the result was not as expected, and that the proposition of nominating an international commission of epidemics came to grief. (Comp. an article by Professor Sigmund at Vienna, in *Die Vierteljahrsschrift für öffentliche Gesundheitspflege*, 8 Bd. 1877, p. 230.)

Having made myself acquainted with Professor Hirsch's above mentioned lecture, I judged it right to put myself in communication with my honoured colleague. From Professor Hirsch's answer to my letter, previously addressed to him, I was very pleased to learn that he declared himself essentially of my opinion as far as my moderate view of the danger, supposed to be at hand, was concerned, as well as to the real existing form of the plague. My letter to Dr. Hirsch was mostly, however, of a practical hygienic nature, for I principally called his attention to the necessity of using stronger disinfecting remedies than had originally been proposed by the Russian physicians sent to the plague district.

I am not far wrong, I think, in the supposition that the epidemiologists on the continent and in England do not agree on the whole with the suspicion which has been raised against the Russian physicians during the plague panic. This is confirmed by the fact that such distinguished physicians at St. Petersburg as Dr. Pelikan, Dr. Lenz, Dr. Maydell, Dr. Kade, Dr. Kastorski, Dr. Zdekauer, Dr. Rosow, etc., have declared their agreement with the precautions taken by their government and their opposition to Professor Botkin, whose name has been so often mentioned in this affair.

Through the kindness of Mr. Netten Radcliffe I have later received his memorandum on the plague previously referred to and expected by many with a certain excitement. The title of this memorandum, "On the Progress of Levantine Plague in 1877 and part of 1878; together with an Account of an Outbreak of the Bubonic Plague of India (Máhámari) in 1876–77," must, as far as I can judge, be sufficient to set right every physician who has any knowledge of this subject.[1] Through the reports given by Prof. Hirsch and Prof. Eichwald from the plague-district itself, it now has been confirmed that the Astrachan plague is really of the same character as the Levantine plague; and it further appears that it probably originated from Kars in Armenia.

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[1] [The memorandum here referred to, and two previous memoranda on the *Modern History and Recent Progress of Levantine Plague*, by the same gentleman have just been published in a very convenient form as a Parliamentary paper,

Lastly, I shall mention that though the Danish government has taken a great many steps and precautions in this affair, and though it has been obliged to take these measures in conformity to the steps which Sweden, Norway, and in some degree our southern neighbour Germany have already taken, it has not allowed itself to be carried too far by the general panic. We have finished by putting in force against the plague our moderate quarantine law of 1st May, 1868, respecting the cholera, adding some more stringent regulations.

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together with certain papers on the medical aspects of quarantine, prepared for the Privy Council and the Local Government Board by Mr. John Simon and Dr. Seaton. Mr. Netten Radcliffe's memoranda give a complete history of plague from the time of its reappearance in the East in 1853 to the beginning of 1878, as also much information on the results of recent observation of the disease. —Ed.]

THE PRACTITIONER.

JUNE, 1879.

Original Communications.

ON THE INFLUENCE OF ACONITE IN CONTROLLING PNEUMONIA.

BY WILLIAM DOBIE, M.D., ETC.

THE following cases seem deserving of record; and as the space at disposal is limited, I shall try to make my reports as brief as possible.

CASE I.—A. B., aged 42, of very good constitution, but dissipated habits, got out of bed one night, and stood for some time with his bare feet on cold flag-stones. A few hours after this he began to shiver, and feel pain in the right infra-mammary region, accompanied by cough and rusty sputa. I saw him the following morning. His breathing was hurried, pulse quickened, and temperature a little over 101° Fahr., and minute moist crepitation was audible over the low part of the right lung. Tincture of aconite (B. P.) was given in two minim doses every half hour for the first two hours, and after that, in minim doses every four hours. The next day his breathing was easier, pulse slower, and temperature 100°. He had slept well all night; indeed so much so that he said,—“I presume you gave me an opiate.” Aconite reduced to one minim night and morning. On the third day the heat fell to 99°, and from that time he got steadily better; was down stairs in a few days, and at business within a week.

Case II.—C. D., a railway porter, aged 20. Previous health pretty good, with the exception that about six years ago he had pneumonia, which, he says, was followed by some kind of fever. He was at that time three months off work. He has been fairly well ever since until last month, when, after returning home one day from his work he began to shiver and feel very ill. I did not see him that night, but his companion who slept with him, said his skin was so hot that he could not bear to touch him. I visited the patient the following morning, and found him with a temperature of 103°, quick pulse, and hurried respiration. There was troublesome cough with rusty sputa, and the physical signs of pneumonia were quite distinct. Aconite was given as before, and in twenty-four hours the temperature became normal, and never again, so far as I observed, rose beyond that point. Daily observations were made during the three subsequent days. He has continued well ever since.

Case III.—E. F., aged 68, in pretty good preservation in spite of the fact that he has had repeated attacks of bronchitis; and two years ago had an apoplectic seizure, followed by paralysis, from which, however, he made an almost complete recovery. He got over this winter and spring pretty well until the beginning of April, when he took cold, for which he prudently stayed within doors a few days. At the end of that time, however, he ventured out one very cold afternoon, and as he was returning home felt chill. During the evening he had a severe rigor, and felt very ill, and shortly after began to complain of pain in his right side, accompanied by cough and difficult breathing. I saw him the next morning about 3 o'clock A.M. His temperature was then 104°; and he had coughed up a quantity of rusty sputa. Aconite was prescribed in minim doses every half hour for the first four doses, then in half drop doses every four hours. Five hours after the medicine had been begun he vomited, and had his bowels freely opened; after which he fell asleep and slept quietly until 11 o'clock, when I again saw him. His temperature had fallen four degrees; the pain was nearly gone, and the cough and dyspnœa were much relieved. In the evening the temperature rose again to 101·2°:

but the next day it was normal, and remained so for three successive days. The following week he suffered from bronchitis; but there were no signs nor symptoms of any farther pneumonia.

Case IV.—G. H., aged 4, was taken suddenly ill on the evening of the 17th inst. I first saw him at 7 o'clock P.M. He was then in a state of semi-consciousness, with a temperature of 103°, and a pulse of 144. His respirations were 60 per minute. There were cough and symptoms of pain, especially when he was moved. Aconite was given in half minim doses every half hour for the first two hours, at the end of which time I saw him again. His temperature was still 103°, but the respirations had fallen to 48. Aconite was continued in the same dose every four hours during the night. About 5 o'clock A.M., he vomited what looked like white of egg, his nurse said, and which, she added, must have been in his stomach some days. This was followed by what the nurse called convulsions. He then fell asleep, and when I visited him the next forenoon, his temperature was normal and his breathing easy. The temperature rose once to 99°, but after that it remained normal. Observations were made for three successive days, at the end of which period I ceased attendance, as the child was then evidently quite well.

Remarks.—There is, of course, nothing new in this use of aconite. Since Dr. S. Ringer's views were published, the profession has been more or less familiar with the virtues of aconite in controlling simple inflammation. I very much question, however, if the matter has had that attention paid to it which it deserves. It is one thing to know a truth, and quite another to be impressed by it.

With regard to the first three cases, I think there can be no reasonable doubt that we had to deal with pneumonia. Case IV. is not quite so conclusive. It is open to doubt whether or not the attack was one of simple fever associated with acute gastric disturbance. (Even then it is of some importance to know that we have in aconite an agent which may cut short a febricula in twelve hours.) Without, however, wishing to dogmatise, I think the absence at the onset of any distinctive symptoms of digestive derangement, together with the cough and extremely hurried breathing, are wonderfully suggestive of commencing pneumonia.

The anodyne effects of aconite are very generally known; but I very much doubt if its hypnotic action, which was very noticeable in two of the above cases, has been sufficiently recognized.

All the cases, it will be observed, were seen within twenty-four hours, at the outside, from the beginning of the disease; and it is chiefly then that aconite proves of such signal service. Not that it is altogether useless after the first day. On the contrary, I believe that whenever the pulse and temperature run very high and there is no marked prostration, aconite in carefully regulated doses will often be found useful in moderating vascular excitement, relieving pain, and inducing sleep.

I am sorry to extend these observations so far; but I should like to add that I am not enthusiast enough to believe aconite will cut short every case of pneumonia. On the contrary, I feel bound to state that I have seen many cases where it failed. At the same time, the drug appears to me to be deserving of very much more careful attention than it has yet received.

DIPSOMANIA: ITS MEDICAL AND LEGAL ASPECTS.

BY J. KINGSTON BARTON, F.R.C.S.

The remarks about to be made on the above disease have been gathered from the intimate study of several cases over a lengthened period.

Dipsomania is one of the most frightful scourges of the human race, not only in its results on those afflicted with it, but upon their friends and all who have anything to do with them. Medical men have long since come to the conclusion that dipsomaniacs are entirely unable to take care of themselves, and yet our laws will not provide for any dealing with such people wholly irresponsible for their actions; and although the laws relating to insanity will not recognise that these patients are not accountable for what they do, yet even in the criminal law there is no protection. We will, however, discuss the whole of the legal aspect separately later on.

Etiology.—Hereditary taint is no doubt the most important element. There are, however, two important kinds of hereditary taint:—

1. That dipsomania is a neurosis and only a variety of insanity, other members of the same family either being insane, epileptic, eccentric, or hysterical; or some of the parents or grandparents being afflicted with one or other of the above neurotic affections.

2. That dipsomania as a neurosis only arises from an acquired habit of the parent. That is to say, a man drinks hard either because he is fond of luxurious living or from mere habit with his associates, and the result of this drinking is that his children have a strong tendency to become dipsomaniacs.

So as not to produce misconception we state here that drunkards and drunkenness is an entirely different thing from dipsomania. We shall give our reasons later on.

After hereditary causes, almost the only one is its acquirement by habits of life. Injuries to the head occasionally produce periodic dipsomania. It is extremely difficult to say often which is the real cause, as they react so much on one another. But one thing is evident—dipsomania is rare amongst the lower classes: it is a disease almost entirely found amongst the upper classes.

We do not mean to infer that the lower classes do not drink—of that there is no doubt. But the lower classes are merely drunkards when they drink, or else they acquire those numerous organic affections consequent upon beer and gin drinking, such as granular liver and kidney, diseases of the arteries, &c.

If there is one liquor above another that we are confident most often produces dipsomania it is champagne. The stimulation it produces is of a very evanescent kind, and large quantities can be taken, and for a time it does not produce the headaches and gastric irritation that brandy and spirits do. But on that account its effects are the more insidious and dangerous.

Those who most often become dipsomaniacs are those who either are rich themselves or are thrown amongst those who have money and live extravagantly.

The army and club life are most dangerous schools for any one with a hereditary disposition to dipsomania. For liquor is the main stay of idle men, and in peace time there is not the slightest doubt about officers having an idle life. The numbers of idlers always present at clubs speaks for itself.

We do not in the least wish to draw unpleasant comparisons between the army and navy, but we are certain more dipsomaniacs come from the army, just as we are equally sure that more drunkards come from the navy; and our reason for saying so is that in the army there is much more champagne and wine drinking in the mess-room than in the navy. Again, the weekly guest night of the army leads to heavy drinking, as also the mere mess dinner every night, as men can go on drinking till late at night, knowing they have no work or duty till the morning.

In the navy, however, there is much less champagne and wine drinking, spirits being much more common. Again, as officers have to be on watch every third four hours, so do they have less time for sitting over liquor for any lengthened time; nor do they have the card- or billiard-room of the army mess to linger in for any long time. The night-watches of the navy, moreover, tend to make men drink spirits instead of other liquors. A man just going on or off watch gets more into the habit of having a lot of whisky, brandy, or rum, rather than a pint of champagne; whereas in the army a man invariably (presuming he drinks) gets up in the morning with a bad head from the effects of his dinner liquor, and the smoking and brandies and sodas of the card- and smoking-rooms of the night previous; and his usual remedy for the head is a pint of iced champagne, which generally sets him all right for the time, but within an hour the depression following a morning stimulant makes itself felt, and another draught of liquor is the result, and so on eventually *ad infinitum*. Once this habit becomes established, large quantities of liquor are continually going through a man's system, destroying his gastric system, keeping his nervous system in a continual artificial state of excitement, and making his kidneys mere sieves.

The irritation to the gastric system produces anorexia and continual thirst, and thus furnishes a constant and increasing cause for the dipsomania.

To revert to the navy again: Men are thrown much more upon themselves for resources of pleasure, and if a man has not any means or taste for relaxation, mental and physical, he is tempted to spirit-drinking, and may eventually become a drunkard or die from organic diseases induced by his habit of living.

We might discuss many other important points of difference between the army and navy in the differences of drinking habits they produce, but as it is extraneous to our subject, we must dismiss them without further notice.

Idleness is the most important cause for inducing drinking habits, and consequently that is why members of the upper classes are frequently the subjects of dipsomania.

We have already stated that the drinking of the lower classes produces a different result, but as those differences will be better described under the symptoms of dipsomania, we pass them by for the present.

To sum up, then, the most common causes of dipsomania are a hereditary disposition as a variety of insanity or from previous drinking habits of the parents, or are acquired disease from habits of intemperance and most chiefly due to champagne drinking, and consequently more common in the upper classes. Injuries to the head must again be mentioned.

Before leaving this part of our subject there is one idea we would like to bring forward, which may explain some difficulties. It is this: May not many cases of apparently acquired dipsomania be due to Diabetes insipidus? Because such a common symptom is the enormous thirst for some liquid even after all stimulants are removed. But it is very difficult to say whether a commencing diabetes insipidus might not, in a man slightly given to the use of stimulants, induce him to drink stimulants instead of plain fluid; and the large quantities of stimulants taken would produce brain symptoms which would disguise the diabetes. Dipsomaniacs always prefer a long weak draught to a short strong one, which shows a constant thirst, and it passes through their kidneys very quickly, as they are frequently passing water. However, we only raise the point in the hopes that other observers may take it into consideration when studying patients afflicted with dipsomania.

Symptoms and Progress of Dipsomania. — It would be well to mention here that oinomania is only another name for the same disease that we are treating of.

There are three main varieties of dipsomania—the Acute, Periodic, and Chronic.

The *acute* is rare, and we have never seen a case. It is said to come on after great hæmorrhages, as after labour, or in patients convalescent from fevers, or from excessive venereal indulgence. This variety would seem to resemble an attack of mania in its violence and uncontrollability, and we should advance it as a proof of dipsomania being an insanity and requiring as careful watching and treatment.

The *periodic* is a more common variety. By some authors it is considered the most common form, but in our experience the chronic is more frequent. In this variety are classed those patients who get periodic attacks of drinking lasting for a long or short period. In some patients the attack comes on suddenly. That is to say, they take to drinking large quantities of alcoholic fluids without any premonitory symptom. But more often than not, there is noticed an alteration in character and temper that forewarns those who have anything to do with the patient. In the case of a married man, the wife can almost always tell when an attack is coming on. The length of these attacks vary very much, more especially according to the duration of the disease in the patient. In the early history of the disease the drinking bouts often last from one to three weeks, and during that time the patient is constantly drinking. As he cannot get the quantities of liquor that he requires outside anywhere, he takes to drinking in his own rooms or house. Nothing will stop him. If his friends or servants try to get him to leave off, he storms and rages and terrifies them into submission to his ways and wants. His excuse for drinking is always that he is excessively weak and nervous and requires support, and that it is absolutely necessary for his life that he should have stimulants. His appetite soon disappears, and he only makes vain efforts to partake of any food that is brought to him. Great sleeplessness and restlessness comes on, and in fact the patient is often on the verge of delirium tremens when the disease abates either gradually or suddenly, and he gets fairly well. When it ends suddenly, it is generally from an attack of acute or subacute gastritis, for which he requires and seeks for medical aid. The craving for drink having also disappeared, he willingly submits to medical direction, and under judicious treatment recovers. When the attacks go off gradually there are less severe gastric symptoms, and the craving having become less, there is a diminution in the gastric and nervous troubles.

After patients have lived for several years with these periodical attacks, the duration of attack diminishes in length, and they increase in frequency; the cause of this being chiefly due to the effects on the gastric system. The stomach much sooner resents the large quantities of alcohol put into it, and consequently the drinking fits are cut short by attacks of gastritis, and often also enteritis. But from the attack being shorter, the interval of diminution in drinking also becomes shorter, so that the patient gradually goes on from bad to worse. Once the drinking fit passes off, the patient generally expresses great horror and grief at his propensity and the effects it produces, and will make all sorts of promises to abstain altogether from alcoholic drinks. If the case is not a severe one, and the moral surroundings of the patient are good, he will often keep this resolution for a long period. But eventually, from some cause either of social temptation or mental worry, he again breaks out and becomes wholly ungovernable. We have known cases where a man having recovered from a periodic attack would go for a period of from four to eight months without drinking any alcoholic liquor, but the first taste of liquor after that abstinence would bring on an attack.

A great many cases are called periodic which are really chronic, but with temporary exacerbations, and we will discuss these under the chronic variety. We only include under the periodic those cases where there are complete periods of a natural condition of mind and body; and in almost all these the patients are either total abstainers or extremely careful and temperate in their habits in the intervals between the drinking fits. The higher the moral nature of the patient, the longer are those tranquil intervals, but the lower the moral nature the shorter are those periods. The reason being that a man of high moral nature, either from culture or inherent perception, gets more control over himself and will battle long against the craving when it is coming on, although eventually he gives way not from any fault of his own, but on account of his being the subject of a mental disease entirely beyond his control. On the other hand, a man of low moral standing will never try to keep himself from the temptations that he knows are dangerous for him, and never makes any attempt to stave off the craving, but yields at once. These last are a much more hopeless set of cases to deal with, and are almost always incurable, and eventually die from accidents or diseases induced by their habits.

Dipsomania that comes on from injury to the head is generally of the periodic variety. Blows or falls on the head are followed at a long or short period afterward by periodic attacks of drinking mania. In surgical and medical practice it is well known that similar blows on the head are not infrequently followed by epileptic fits, and both these class of cases, viz., the accession of periodic attacks of dipsomania after injuries, and the periodic attacks of which we have been treating at length above, tend to point to a relation between epilepsy and dipsomania. Just as an injury to the head by producing some alteration in the nerve-centres brings on epilepsy, so do they at other times bring on dipsomania by no doubt causing also some alteration in the nervous tissues. Again, where there is insanity in a family, in the progeny there is a great liability to a repetition of that same condition of the nerve-centres which produces insanity, or else some modification of it, such as epilepsy or dipsomania, for in almost every case of periodic dipsomania is there to be found a history of nervous affections. There are cases on record of transitions between these two affections. Either an attack of drinking passing off by an epileptic fit or patients at one time having an attack of epilepsy and at another time an attack of craving for drink. In fact the two affections are very much alike in many ways. Judging from cases under observation, the periodic variety seems hardly ever to be induced by acquired habits of drinking alcohol, it being almost always the result of strong hereditary tendency to neurosis of some kind. Our object in laying such stress upon the real insanity of dipsomania is to get its recognition as such by the legislature, and we shall presently resume the subject more in detail.

We stated just now the difference in effect upon the course of dipsomania caused by the presence of more or less high moral nature in the patient. All those who have studied insanity have come to the conclusion that very often there is a complete absence of the moral nature—patients not having the slightest conception of any moral obligations due to their fellow beings or themselves. Very frequently amongst dipsomaniacs is there this complete absence of any morality.

It is not often recognised. Friends and acquaintance of the patient accuse him or her of immorality unjustly. For a man cannot be immoral who has no ideas of morality to start with. Many will think such a state of things incredible, but it is really not so. Patients suffering from dipsomania often behave very well for a time, but it is only from the effects of habit from the way they have been brought up. They may do what is right, and often appear to go out of their way to do what is right, but if one could get at the root of their actions, it would be found that they were not guided by any moral feeling or sense whatever.

Dipsomaniacs show this perversion, or rather, absence of morals, in almost all their dealings with their friends and relations, and it is on this account that the disease is such a scourge to the friends and relatives. The patient will give the most solemn promises not to take any stimulant, but the backs of those to whom he has made the promise are no sooner turned than he violates it, either by obtaining the liquor himself or not refusing the first or any temptation that is set before him. They always have a plausible excuse when taxed with their violation of promise. They will also prevaricate most cunningly until the question is put directly to them. It is curious that in spite of the absence of moral nature they will rarely tell a deliberate lie. Some people might think this was due to a vestage of morality, but it is, we think, due simply to a knowledge of their weakness, and to the power exercised by a stronger mind over theirs. This habit of prevarication, of never giving the lie direct, they are cunning enough to bring forward as a plea for their being trusted occasionally. But in our opinion, a dipsomaniac can never be trusted. It is not right that he should be led to suppose so, for that would do him inevitable harm, as we shall see presently in discussing moral treatment for dipsomania, but at the same time one would never rely on the promises given by a dipsomaniac, more especially if it is in regard to taking any precautions for guarding against his propensity.

As regards the recurrence of these periodic attacks they do not seem to have any regular intervals. In some patients there is a cessation of the drinking propensity for many months, in others, only for a few weeks. In the chronic variety we shall have to mention that where periodic exacerbations occur they often do so at regular intervals, and the length of time is generally a month.

In women, where the generative functions are periodic, dipsomania, like so many other varieties of insanity in women, is apt to recur at intervals corresponding to the menstrual periods.

The progress, then, of periodic dipsomania is generally an increasing frequency of the recurrence of the attacks which may verge into the chronic variety, but as often as not kills the patient before that stage is reached.

Amongst this class, however, are found some who do appear to be cured by careful and judicious treatment during the intervals. The treatment consisting in elevating the moral nature by every possible means, improving the patient's general health, and getting him to employ his mind and body actively. There is one drug which ought to have extensive trial for treating the periodic attacks. Bromide of potassium is well-known to be of great service in reducing the frequency and force of epileptic attacks, and seeing the close relationship of dipsomania to epilepsy, it ought to be of use. We have not had the chance of giving it much trial in the periodic varieties, but in the chronic it is of immense service.

In those cases where the moral nature is evidently low, weak, or absent, no hope can be held out for cure, and the patients will be an endless source of misery to themselves and relatives till they die. It is for these cases that a proper law is so much required. During the attacks nothing but restraint can keep them from liquor.

Men who suffer from periodic attacks live a little longer than those whose attacks are chronic in their nature. Amongst women the periodic is more common during the whole of the time of the existence of the generative functions. Chronic dipsomania in women more often comes on later in life.

Chronic Dipsomania.—We are certain this is the most common form. Those suffering from it generally commence drinking at an early age, usually 17 or 18, and by 30 years of age most of them have died. They die either from the direct effects of the drink they are continually consuming, or else from diseases induced by it, such as absolute insanity or diseases of liver and kidneys. The disease is not generally recognised in the first few years of its course, as the patient's friends and relatives merely suppose him to be living a little too fast, and that he will pull up soon. However, after a few years it is found that he is never really free from the effects of liquor. He is hardly ever really drunk, but is never sober. As we have said before, champagne is the usual drink during the first years of a dipsomaniac's career. When he takes more than enough, it shows its effects by making him very sleepy, and he will lie down at the most unusual times and places, and fall off into an apparent dead sleep, from which it is very difficult to awake him, and if one does so, he usually manifests a disgusting temper, and will curse and swear at his best friends. This sleep does not rest the brain at all, as when they do wake up voluntarily they are by no means refreshed, and immediately have recourse to another stimulant, which generally freshens them up for a short time, but they very soon require restimulating.

In the early days of their career, these men often go through a large amount of fatigue, and consequently for a long time ward off the mental effects of their drinking. They will hunt vigorously, and shoot, walking long distances, but the excitement of horse exercise is what they most delight in, as the fatigue enables them to drink large quantities of stimulants without much apparent effect. But after several years the muscular as well as mental system begins to fail. They cannot go through the fatigue they were formerly capable of. Their will also fails. Overnight they will make engagements and promises for the morrow, but the morrow finds them unable to perform their promises, not having the will to carry their projects out.

Every now and then the patient acknowledges that he is drinking himself to death, and he will slacken in and reduce his quantities of stimulants but never leave them off entirely. He very soon, however, resumes his usual large potations. Occasionally he can be induced to go to a home or inebriate asylum for a time, but he never stays very long, and is no sooner out than he resumes his former habits. It is a fearful existence, the constant craving for fluid, and that fluid must have some taste. All dipsomaniacs have a complete antipathy to water. They will drink anything but water. If they cannot get stimulants they will drink soda-water, lemonade, or gingerbeer, in enormous quantities, so much so indeed that the mere quantity of these apparently harmless fluids which they drink is quite sufficient in itself to ruin their digestive powers. Many people think that it is only necessary to substitute these supposed harmless fluids for alcoholic drinks to produce a cure. The idea is entirely fallacious, as large quantities of those fluids are as likely as not to induce dipsomania itself. There are two classes of dipsomaniacs that are very different from each other in their habits of eating. One set has the most voracious appetite, eating enormous quantities of meat cooked in all forms. These patients are generally wine-drinkers, and very often claret-drinkers. Another set of patients eat very little, their stomachs being unable to retain or digest the food. In the first class the large quantities of food taken is not properly digested, as is evinced by their constant call to get rid of their excrement. In fact some of these patients seem to occupy a great part of their time by evacuating their bladders and rectums of the large quantities of food and drink they ingest. The diet of those who only eat a small quantity is generally a meat one. Dinner is their usual meal. Breakfast and lunch are meals they never can accomplish.

Their usual routine of life consists in getting up early or late in the afternoon, rarely in the forenoon. But during the morning they have been taking continual small doses of beer, champagne, hock, or claret, generally diluted with soda or seltzer, and have short snatches of a boozy sleep. Having come out by the afternoon they attempt a dinner in the evening, and with a fair amount of liquor in them, they bring themselves up to the scratch to play billiards or cards, but they soon get tired, as they call it, and lie down and go off to sleep. By about one or two in the morning they wake up, and from then till eight or nine is their miserable time. They cannot sleep. The effect of the liquor is passing off and they get frightfully nervous. They often wander about the house, and if they cannot obtain any liquor before the general hour of rising of others, they are usually reduced to a state verging on delirium tremens. Directly they get some liquor, however, they go and undress and go to bed, and so on till the afternoon, when the repetition of the night before takes place.

In the early history of dipsomaniacs they have usually had one or more attacks of delirium tremens, but after recovering in a way from them they are never able to drink the large quantities of stimulants they used to do formerly, as they get so much sooner prostrated and intoxicated that they never get real delirium tremens again. We have seen patients in whom the disease is of long standing so altered that one or two glasses of beer would make them quite boozy. Also after the attacks of delirium tremens they never seem to recover their muscular tone and power, and consequently cannot go through the same amount of exercise. The reason of this is of course that they go on drinking. If their liquor was stopped, physically they would get quite well. A very characteristic sign of the chronic dipsomaniac is a diffuse roseate hue of face and neck and a watery aspect of eye. They are generally full-bodied, but they are always weak on their legs, and late in the disease get into almost a state like locomotor ataxy. Besides the roseate hue of face there is another symptom indicating the determination of blood to the head, and that is a constant recurrence of slight hæmorrhages from the nose. The pocket-handkerchiefs of dipsomaniacs always contain secretion mixed with blood. This is only found in old standing cases, and is often alone due to the congestion of the liver, which is constantly present. The urine in the morning is generally very high coloured. The pulse in the morning is also always weak, soft, and small. We have already stated our belief in the absence of any moral feeling in these patients. It is hard often to decide whether the drink may not have removed their moral sense by its effects on the brain. For a man may have possibly started in life with a fair proportion of the moral sense, but the physical action of alcohol on his cerebrum may have destroyed his moral appreciations. No doubt this occurs in truly acquired dipsomania. But in these latter the disease comes on later in life. Where the disease is hereditary, and is an insanity, and begins earlier in life, one generally finds that even in their boyhood they evidently were devoid of moral sensibility. The cunning of these patients in using every artifice to get drink, when they know efforts are being made to keep them from it, is really wonderful. They will hide bottles of spirits amongst their clothes. They will, in the earlier stage, walk long distances so as not to be seen drinking, will use persuasions and threats to those attending on them, and will eventually beg to anybody for drink to satisfy their craving.

Before passing on to the treatment for dipsomania it is necessary to contrast drunkenness with dipsomania. That they are quite distinct is evident to any one who has studied the facts concerning them. Drunkards are men or women who when they drink do so to a complete state of intoxication, but when they recover from their drink they find themselves wretchedly ill and are quite conscious of their moral wrong, and are thoroughly ashamed of themselves. They know also that they must not drink if they have to go on with their work, and so for a time they keep right, but from bad training and contact of constant temptation they frequently give way to their vice. Drunkards generally come from the lower class, and as the whole moral sense is not raised to such a high extent amongst them as it is in the upper classes, they consequently give way more and become drunkards from a real moral depravity. As perhaps the moral sense is the highest mental attribute, so it is the one that fails first in degeneracy of the mind. Now there is no doubt that insanity is a degeneracy of the intellect, and consequently in hereditary tendency there is a likelihood of this first attribute, the moral sense, to fail, and if combined with this there is a craving for drink, then occurs the real dipsomania with absence of moral feeling. Whether this craving for drink is really induced by an innate feeling in the sufferer that his brain is not up to the standard and that he wants stimulation is hard to say, but it looks very like it; for in dipsomaniacs when their liqour is removed they suffer terribly from the feeling of mental weakness and seem not to have the power of concentrating their attention on any habits of life or any ambitious or other projects. Living for the present is their whole desire. They cannot even look forward to the future of their life in this world, much less can they bring themselves to think whether there is such a thing as future existence of the soul.

In discussing treatment we shall revert to this difference of drunkenness from dipsomania in the presence or absence of a moral sense.

It must not be supposed that because in dipsomaniacs there is generally an absence of the moral sense, that they are wholly brutal. Far from it. On account of their education and that they generally are of good birth and breeding they inherit and acquire many refined tastes, and during their early career are favourites in society. A proof of the absence of the moral sense in dipsomaniacs is their indiscriminate way of gratifying their venereal desires. They are generally insatiable, and the wonder is they do not often get into more serious trouble, but the fact is they have a peculiar enticing way that women seem to approve of. This itself is a constant cause for keeping up their drinking habits. As their excesses are great they have to drink freely of stimulants to keep themselves up, and late in the disease they cannot gratify their desire except they are fairly intoxicated. Still later they become impotent and lose the desire. Dipsomaniacs are, as a rule, not very great smokers, but when their liquor is knocked off they smoke immoderately. In long standing cases when their drink is cut off they become frightfully obstinate and morose. They are utterly unable to manage their own affairs, as they are never able to go into them properly, and they invariably get into debt and all sorts of money difficulties. They lose all sense of the value of money in their intense craving, so that they become the prey of thieves and swindlers in all directions. Gambling is another taste often present. In fact constant excitement is the craving of the dipsomaniac.

Treatment.—And now comes our difficulty. How are we to treat a disease which we recognise as an insanity, but which the law of the land will not recognise? It is a shame and disgrace to England that its Parliament will not make any enactments for the physician's help. All our colonies—Canada, Australia, and New Zealand, and also America, have all seen the necessity for such laws, and have made them; but here, in civilised England, a man may destroy his health, in fact, commit a slow suicide, and destroy the happiness of his own family, without any intervention being allowed. If married, he leads his wife the most awful life. His children, who all run the risk of inheriting his disease, are under his control for their education and bringing up, and have him as an example for their lives. In this country, where men inherit titles and properties which are not their own, but only theirs for their lifetime, and in return for which titles and position they have their obligations to society and the country at large—we repeat, in this country, it is far more essential that there should be some protection by law to save insane men from utterly ruining themselves and their families. In America and our colonies there are not nearly such urgent reasons for the law interfering in such cases, yet they have seen the necessity for such interference, and have in addition found out its benefit. As long as lawyers have the making of laws for the treatment of insanity, so long shall our laws be inadequate. Medical men, and the opinion of a large portion of the *educated* public, are those who can judge better what laws ought to be enacted. The popular hue and cry of the unthinking and uneducated classes—and we are sorry to say, of many bigoted and narrow-minded educated people—is, that the liberty of the subject must not be interfered with at any cost. Liberty of the subject is a very good doctrine where might is right; but in a country composed of civilised beings forming a society, individuals who cannot conform to usages for the good of that society, either from wilfulness as the vice of drunkards, or those beyond their own control as dipsomaniacs, must lose their liberty if they are to remain in that community. Consequently we would advocate the punishment of all wilfulness, even including drunkenness, and the careful restraint of all those who are beyond their own control.

For dipsomania there is but one cure—total abstinence from any alcoholic liquor. If the patients cannot control themselves, then should the State interfere, and place them under restraint. If dipsomania brought no evil results on any one but the sufferer himself, there would be some justification for the cry against taking away a man's liberty. But as dipsomania entails ruin, disgrace, and poverty on so many others who are absolutely dependent upon the vagaries of this variety of insanity, so is there the more reason for the State interfering.

We are not placed even in the position of making an experiment. The trial has been made, and with great success, by other State authorities.

In our colonies if a man can be proved by good witnesses to be ruining his health by drink, squandering his means, and neglecting his family, and that he will not give up the cause of this, then has the judge of the supreme court of his district the power to have the patient committed to an inebriate asylum for a period of not longer than twelve months, for medical treatment and supervision.

This period, although short, has been of immense service. As total restriction from drink for that period gives time for the brain to recover itself, and also gives time for the patient to reflect on his condition and the consequences of his craving, so does it send him out of the asylum for the time being cured. But as the disease is an insanity, he eventually, sooner or later, breaks out again; but on each outbreak he can again be committed for a twelvemonth, and as this loss of liberty is greatly felt by the dipsomaniac, so does it act beneficially, as that alone will enforce him to make efforts not to give way to his craving. And what is more important, his relatives have the satisfaction of knowing that when an outbreak of the disease occurs they can protect themselves or his family from incalculable injury. Again, if a man is married, as long as he is actually drinking, children begot by him run the most frightful risk of inheriting his insanity, or any other neurosis. Whereas, if he can be confined during his outbreaks, and is only at large when he does not drink, there is more chance for his children, although in any case the risk is so great that we should strongly advocate for every effort being made to prevent a dipsomaniac, male or female, from being allowed to marry. It is not infrequently that girls allow themselves to marry a man who is a known drinker, in the hopes that they can cure him. It is a frightful experiment, and woe to the happiness of the woman that makes the attempt! Nature makes efforts herself to stamp out the race by producing idiots, or mentally-diseased children, and even by inducing a tendency to abortion in women.

It is to be hoped that a day will come when the human race shall be educated to that point that marriage, instead of being the mere caprice of lust, wealth, and romance, will be under the government of sound common sense, and of the laws of health and inheritance of mental powers and bodily diseases, so that proper and judicious selection, for the welfare of those intending to live in the marriage state, and also for the promise of a good progeny, will take place.

We are not so unpoetic as to suppose that what is called *love* will ever die out, but if people in their younger years had better training, and were taught the laws of inheritance, men would instinctively shrink from a union with a girl whose family history was bad, just as a woman would avoid marriage with a man whose family inherited such diseases as insanity or tubercular affections.

We would strongly insist, as one of the items of treatment of dipsomania, on efforts to stamp it out. Women should be urged not to marry a man suffering from it, or even if it is in the family. To return to the treatment by restraint: it has been found in America, where the most extensive trials have been given to various methods of treating dipsomania, that three years is the least length of time that a patient should be kept under supervision. After that, there is some chance of his recovery. During the period of confinement every possible means must be used to improve the moral condition of the patient. That is the real difficulty. If a man has no ambition, no desire to acquit himself well in a high moral sense in his course through this life, it is hopeless to do anything with him. But all the more reason on account of this hopelessness should he be kept under control for a time, and whenever he breaks out again be reconfined for a lengthened period. Until we discover better methods of cure, we must only do what is best for the progress of our society.

A plea advanced by the opponents of State interference with dipsomaniacs is that people who wished a relative kept out of the way would often make use of this law to get an innocent individual confined. No plea is more absurd. To begin with, the judge, in whose hands the power of giving consent to the confinement of a dipsomaniac rests, is far too careful nowadays of his reputation to give such consent on insufficient grounds. Again, besides family witnesses, two medical men's opinion would be required, and the judge would satisfy himself that they were men in a position such as would prevent them also from running a risk of losing their reputation. To bribe all three, to give false opinion, would be impossible nowadays. And even if it were possible by limiting the term of confinement, when a man was set at liberty, if he had been unjustly secluded, he could soon prove his case, and have the matter recognised. In whose hands the power should be vested would be a matter of consideration, as it would be necessary that applications should be heard whenever made. County-court judges or resident magistrates would no doubt be the proper authorities. In the colonies it is worked thus: An application is made to the judge of the supreme court, and he grants and fixes a day for the hearing of the case *in banco*, and gives his decision there and then, making necessary orders for payment for the cost of keeping the patient, as the Government keeps up the institution.

In this country it is constantly advanced as an argument against the State looking into the matter that it would entail endless expense. The majority of dipsomaniacs are of the well-to-do classes, and they can always afford to pay a reasonable amount for their keep. A proper institution of the kind could be worked by Government, free of expense to the State, by charging 60*l.* to 100*l.* each patient. As regards the lower classes, if there are dipsomaniacs amongst them, it is cheaper for the Government to keep them in an asylum for a time, and try and improve them, than to send them to jail, where they are sure to go, either from debt or crime committed during their attacks. For drunkards, that is, men who drink from vice, nothing but punishment is available, and the laws ought to be more strict. It is over and over again brought forward as an excuse for the most frightful crimes that a man was under the influence of drink. All we assert is, that if a man knows that he will get drunk by drinking, and that when drunk he may commit any crime, then is he responsible for being drunk, and consequently for any acts he commits in that state. If men knew that they would be punished for any crime committed under the influence of drink just as severely as if they had been sober, it would act as a strong deterring agent. Again, the mere fact of being drunk anywhere in public ought to be punished as a crime. In this country a man may be a disgusting sight in public, and nothing can be done to him except he assaults or interferes with some one, in fact, until he has committed some crime; that is to say, the State will not make an effort to stop it. We have not yet got to a condition that we can regulate a man's private life; but his public life should be in accordance with the pleasure and prosperity of the majority. If a man likes to get drunk in private, let him do so, but he has no right to be drunk in public, and, if found so, ought to be punished severely; that is to say, severely enough to feel it.

Of course such legislation as is sketched out above will never of itself cure drunkenness. But we have to meet an existing evil, and there is no other way of doing it. The stamping out of the curse of drinking is only to be effected by moral means. The young and the future generations are those to be trained. Nothing but force will keep existing drunkards in order. Education which has a sound moral basis is the only one capable of lifting the masses to a sense of their duties. Example is the surest method of teaching; and most important of all other, liquors harmless in their properties should be brought forward. Coffee and cocoa no doubt are the best liquids where milk and good water cannot be obtained.

A most important element in the treatment of dipsomaniacs when they are confined is to give them occupation, even if it is enforced. Something to fix their minds on is very necessary. The sudden stopping of their liquor never does them harm. On the contrary, instantaneous good. There is nothing so ridiculous as to suppose that alcoholic drinks cannot be discontinued at once. We have never seen harm accrue from the practice. Of course we excluded wounds and fractures in heavy drinkers where delirium is apt to occur if stimulants are cut off. But in an ordinary dipsomaniac it should be discontinued at once when he is put under treatment.

Unfortunately all the advice given above is what might be and what should be, so that we must now see what can only be done.

If a man is found to be a confirmed dipsomaniac and is constantly getting ill and getting into all kinds of scrapes, the worst thing his friends can do is to be constantly paying his debts and setting him straight again. It only encourages him to continue his practices, feeling that he will always be extricated by some one. It would be far better to let the law take its course, for this class of patients would be constantly appearing in court for debt, assaults, &c., and if they got punished it might have some effect in getting our legislature to see the anomaly of punishing a man for acts for which he is not responsible; and if the case were not a confirmed dipsomaniac, the mere fright and shame of the punishment might have an effect in stopping him.

We admit this is, of course, a clumsy and almost inhuman way of acting, and that is why we should strongly urge combined action on the part of the medical profession to get the State to interfere on behalf of dipsomaniacs as they do for other germs of insanity. At present the law only recognises a man as insane who has delusions or hallucinations, a most absurd criterion. We believe that one of the great judges ruled it as insanity under the definition *non compos mentis,* which apparently ought to be sufficient to cover dipsomania, but unfortunately it does not. For what is a dipsomaniac but a man not of right mind! He can only think of one craving, and he invariably ruins his health and wealth and gives his family a fearful amount of trouble.

From the Americans we have learnt much as to the benefits of restraint in the treatment of dipsomaniacs. Curiously several American authors seem to think dipsomania is rare in England and Europe, and only well known in the States. We wish such were the case, but unfortunately it is extremely common in England amongst the well-to-do classes. To return to the treatment at present within our power, if, as we have stated, a dipsomaniac gets into debt and trouble, his relatives should only redeem him on condition that he submits to their guidance and arrangements for him. Of course, if they can afford it, he requires a medical man and an attendant as a valet, and every possible means of diminishing his liquor must be used, but at the same time every moral effort should be made to raise and improve his tone. It is of no use sending a patient away to travel, as he only breaks out in awkward and distant places and gives no end of trouble and anxiety. Country or sea-side and the exercises to be obtained there are the most beneficial. If in a town or London, he is sure to be at clubs, music-halls, and every place where he can get drink and excitement.

The only drug that is of any real service is bromide of potassium, which is of immense use in allaying the nervous irritability and getting them to sleep at night instead of drinking. But the worst of it is patients also find out the benefit of the drug, and as they know it is less harmful than opium, they do not mind drinking, for they feel there is one drug can benefit them, and so there is less incentive for them to give up alcoholic drinks.

In chronic dipsomaniacs monthly exacerbations often take place, and in one case we know of the patient used to get very nervous by the Saturday or Sunday every week and then begin drinking heavily. Bromide of potassium is very useful when these attacks are felt or expected to come on. For the gastritis that so often comes on there is nothing so good as a mixture containing sodœ bicarb., liq. morphia acetatis, and hydrocyanic acid. Chlorodyne relieves the diarrhœa often present, but leaving off the liquor is the only and best cure for that symptom, as of all the others.

We may sum up, then, that dipsomania is a real insanity. That if unchecked it will assuredly kill the patient. That the only possible way to cure or stop it is to put the patient under restraint for a period not less than twelve months, but if for three years, there is more chance of a permanent recovery. And we would urge most strongly the necessity for the State interfering and legislating on their behalf. Also that we require two distinct acts — an act for the treatment of dipsomaniacs, and an act for habitual drunkards.

CHRONIC BRONCHITIS.

BY D. J. HAMILTON, M.B., F.R.C.S. ED., L.R.C.P. ED.,

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(*Continued from* p. 350.)

We have now described the most striking and essential features of chronic interstitial pneumonia arising in connection with bronchitis, and it must next be shown what mutual relation they possess. In order to understand this we must revert to the description given of the lymphatic system of the lung, as seen in the natural injection which takes place in anthracosis and other forms of pneumokoniosis. Foreign matters, when inhaled, pierce through the alveolar walls and inject the plasmatic spaces which, as demonstrated by Klein and others, lie upon them. From this they pierce into the peribronchial and perivascular lymphatics, distending the large lymphatic vessels of the latter to an enormous extent. They are then conducted into the lobular septa and deep layer of the pleura. The peribronchial lymphatics which lie in the adventitious coat have a free communication with the rich plexus of lymph spaces and lymphatic capillaries which are found in the bronchial mucous membrane, and the peribronchial lymphatics seem to anastomose freely with the periarterial. The course of the lymph-stream is from the mucous membrane of the bronchus to the peribronchial tissue, from this to the arterial adventitious coat, then to each side of the lobular septa outwards to the deep layer of the pleura, and from this to the bronchial glands at the root of the lung. These, curiously enough, are the situations in which the fibrous thickening is perceived in chronic interstitial pneumonia;

the fibrous new formation embodying the pigment particles which are usually simultaneously present in the lung. Tubercles are formed in the same situations, and hence we are abundantly justified in saying that the interstitial thickening follows the course of the lymphatic vessels.

We have previously drawn attention to the enormous cellular deposit that occurs in the mucous membrane in chronic bronchitis, and how it seems to be retained within the bronchial wall by means of the strong elastic basement membrane lining the mucous surface. We have, moreover, seen that, from the bronchial mucosa, long lines of the inflammatory cells infiltrating it stretch into the bronchial adventitia and lobular septa. They follow the course of the lymph-stream, and undoubtedly, like the inhaled particles which accompany them, find their way to the deep layer of the pleura, and to the bronchial glands. From this, the cause of the interstitial pneumonia in chronic bronchitis will be apparent. The accumulation of inflammatory effusion which takes place in the mucosa is pent up by the resistent basement membrane. It cannot be thrown off into the bronchus, and, consequently, in the course of time, the cellular structures, partly by their amoeboid movement and partly by the force of the lymph-stream, pierce into the peribronchial and periarterial lymphatics, and not only infiltrate but also excite them to inflammatory action, resulting in the production of the changes seen in Fig. 21. The same thing happens in the lobular septa. The lymphatics become distended with inflammatory cells, irritation is the result, and proliferation of endothelia and blood-vascular diapedesis follow. The pleurisy which ensues in such cases is undoubtedly due to the same cause. The deep layer of the pleura in an early stage of the disease can be seen to be enormously infiltrated with inflammatory exudation, there is great vascular disturbance, and, apparently, the superficial layer participates in this, and exudation of plastic lymph on its surface results. All the subsequent changes in the pulmonary interstitial tissue and pleura can be easily understood when the cause of their origin is borne in mind.

Looking at all this in a comparative point of view, there is nothing very extraordinary or unusual in it after all. It is nothing more than what is seen in a limb, for instance, where an irritation of a peripheral part has existed for some time. In such a case the lymphatics of the limb become in course of time enormously thickened, and a permanent development of cicatricial tissue around them results. In the lung, in bronchitis, we have analogous conditions. The catarrhal inflammation is a constant source of irritation in the mucosa, and, as a consequence, the lymphatics in communication with it, having to discharge the part of removing unnecessary tissue products, become clogged and themselves irritated. Their irritation reacts upon neighbouring parts, and induces the inflammatory changes to which we have just referred.

It is by no means necessary that the irritation should always primarily be bronchial. A degenerating deposit in the air-vesicles will, in course of time, produce the same lymphatic disturbance in varying degree, according to the amount of irritation present. All caseating masses of catarrhal products accumulating in the air-vesicles cause a certain amount of chronic interstitial pneumonia, probably from the absorption of the caseous material, and whether the interstitial pneumonia results from such accumulations in the air-vesicles, or whether it arises in consequence of bronchitis, the effects are *essentially* the same, although the thickening in the one case may primarily be localized to a certain group of air-vesicles, and in the other to the bronchus in which the catarrh has originated. Both ultimately tend to thickening of the lobular septa, to a chronic form of pleurisy, and to an enlargement of the bronchial glands—a course that is fully explained by the ramifications of the pulmonary lymphatics.

Ever since Laennec showed that many of the cavities found in the lung in various diseases were in reality dilated bronchi, numerous theories have been offered in explanation of how they are produced. It seems to us that in most cases the inventors of these theories have been much too exclusive in their reasoning, and have too often ridden their pet "hobby" to death in endeavouring to explain effects which obviously may originate from various causes. We do not intend to consider the subject of bronchiectasy in a systematic manner at present, but will merely refer to the special form of it which is connected with chronic interstitial pneumonia. We have described the appearances in these bronchiectatic cavities, and it remains to be shown in what way the dilatation is brought about.

Corrigan, in his classical essay on the subject, says:[1] "If there were but one bronchial tube with contracting fibro-cellular tissue around it, then the contracting tissue would, as in the instance of the stricture of the œsophagus or rectum, cause narrowing of the tube; but when there is, as in the lung, a number of bronchial tubes, and the contracting tissue not placed around the tubes, but occupying the intervals between the tubes, then the slow contraction of this tissue will tend to draw the parietes of one tube toward the parietes of the other, and necessarily dilate them." To this statement, with all due deference to the scientific manner in which the paper is worked out by its eminent author, we are constrained to say, "*non sequitur.*" For if it be true, why then is it that in cirrhosis of the liver, and in cirrhosis of most of the other organs, dilatation of the tubular structures and blood-vessels within them does not occur from the same cause? We believe that there is a slip in the author's statement which probably has been recognised since the above was written, and which consists in the omission of the fact that the rigid chest-wall acts as the fixed point in the dilating process. The liver, œsophagus, rectum, and most other organs have no such fixed surroundings to form a point of resistance, and as a consequence contract towards their own centres, and produce constriction and narrowing of all the tubular structures within them. The two pleural surfaces of the lung, however, may, practically speaking, be said to be united, and the invariable pleurisy which accompanies chronic interstitial pneumonia of course renders this complete, so that there is the rigid arch formed by the ribs and vertebræ to act as a counterpoise to the easily dilatable bronchial-wall. We shall presently show that the dilating power is in great part to be found in the contracting fibrous tissue, and will be exerted in a direction towards the central point of the contracting band, reacting on the one hand on the chest-wall, on the other on the bronchial wall. A balance is then to be struck in the effect which this traction will produce when exerted equally upon the arch of the comparatively thin bronchial-wall in a direction outwards, and on the rigid costal-wall in a direction inwards. The result that must follow is obvious. Both the chest-wall and the bronchus will be influenced, but the former, being much the stronger of the two, and representing an arch with its *concavity* towards the point of traction, will be influenced to a less extent than the thin wall of the bronchus, which, moreover, represents an arch with its *convexity* towards the point of traction. The bronchus consequently becomes immensely dilated and the chest-wall to a certain extent retracted—two phenomena which are of constant occurrence in this disease. In fact, the bronchial dilatation would be very much greater than it usually is were the loss of volume in the chest contents, through cirrhotic contraction of the lung, not to a certain extent compensated by the drawing upwards of the diaphragm and liver.

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[1] *Dublin Medical Journal*, 1838.

But let us examine a little more closely the special mechanism which exists in the lung for the carrying out of these mechanical data. If we look at Fig. 1 it will be seen that, continuous with the deep layer of the pleura, the lobular septa run into the lung-tissue, and are directly united to the wall of the bronchi. There are usually, as represented in the figure, three or more such lobular septa attached at intervals to different parts of the bronchial circumference, and they are inseparably united to the peribronchial fibrous tissue. When these lobular septa are traced throughout the lung, in whatever direction they pass off from the bronchus, they invariably end, it may be after giving and receiving many collateral branches, by becoming united to the deep layer of the pleura. We accordingly see that in the normal lung there exists a mechanism which is specially adapted for the production of bronchiectatic cavities on the principles we have referred to.

Let us see whether there is any direct evidence that the shape of the bronchiectatic cavities corresponds to the lines in which the dilating energy has been exerted. Fig. 36 represents a large section of a lung in chronic interstitial pneumonia magnified about two diameters, the same lung in fact as that represented more highly magnified in Fig. 32. The cavity in the centre is a bronchiectatic cavity, part of which is also represented in Fig. 32, and around it are noticed the thickened bands of cicatricial tissue, while the pleura, also much increased in bulk, is seen at the upper part of the figure. The cavity, it will be noticed is very irregular in shape, being drawn out into angular projections. If these angular projections be looked at, it will be observed that bands of cicatricial tissue run off into the lung substance in lines corresponding with each. If we represent the contracting bands diagrammatically, in the scheme seen in Fig. 37, the direction of the contraction will be better understood. Let P P represent the thickened pleura, B the bronchiectatic cavity, and F F the fixed points in the pleura on the one side, and at corresponding parts of the pleura on the other. If, now, the contracting bands of cicatricial-tissue shorten towards their central points, the traction will be exerted in the direction of the arrows, and the conclusion is irresistible that the bronchus, being the weaker of the two attached points, must become dilated. The irregular shape which the dilated bronchi have in this variety of bronchiectasy, as distinguished from certain other forms whose cause is different, entirely bears

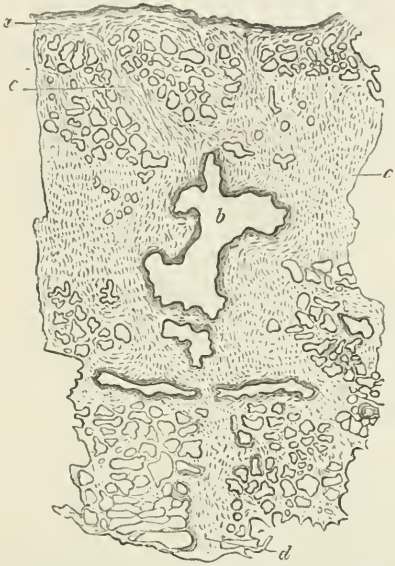

Fig. 36.—Chronic interstitial pneumonia. ×2 Diams. *a*, thickened pleura; *b*, bronchiectatic cavity; *c*, thickened lobular septum; *d*, thickened septum running inwards.

out what we have said in regard to them. That the negative inspiratory pressure aids, as suggested by Corrigan and others, in their production, is, we think, somewhat doubtful. We would look upon the bronchiectasy, in this disease, not as one produced by sudden alterations of the atmospheric balance, but rather as illustrating a principle that is to be found in many other instances in connection with contractile new formations in different parts of the body.

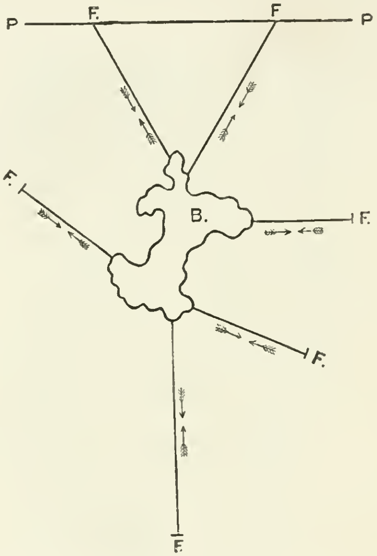

FIG. 37.—Scheme of Fig. 36. P P, pleura ; F F, attached points in pleura and surrounding parts ; B, bronchiectatic cavity.

(*To be continued.*)

OBSERVATIONS ON THE LAWS OF HEALING BY DRUGS.

BY WILLIAM SHARP, M.D., F.R.S.

(*Continued from* p. 357.)

III.—The Kind of Action.

The kind of action of the larger doses of the drug, when taken in health, must resemble that of the disease.

The charm, and it is a real one, of the medical man's life is for him to have one prevailing feeling—sympathy with his patients; and one ruling desire—the wish to heal them. His office has been created by pain. His ministry, through day and night, is fitted to cherish unselfishness, and to excite the noblest emotions of his heart. Whose thoughts are not widened, whose affections are not warmed, by such a calling? Who can help resolving that, as far as in him lies, medicine shall not be left for ever to the fate, so emphatic, of the hindmost? Let us, then, with pleasure go on with our work.

The treatment of the sick has two great divisions: one, embracing all which belongs to the feeding, nursing, and comforting of the sufferer;—this the friends of the patient share with the physician; the other, the use of medicines—this is the doctor's work and care alone. The burden of this latter duty rests upon him, and others cannot relieve him of any portion of its weight.

For the performance of this duty the physician has to acquaint himself with diseases. He has also to study the phenomena which belong to the action of medicines; the laws which govern these phenomena; and the inferences which can be drawn from the laws, as rules for his guidance in prescribing. Here, then, are phenomena or individual facts; laws or general facts; and rules or practical facts. All these are to be looked at steadily without putting on the coloured spectacles of theory.

In the early portion of this paper, it was attempted to be proved that the best mode of learning the actions of medicines is to experiment with them on healthy persons. In the second part it was shown that the first general fact or law which these experiments have taught us is, that every drug acts more powerfully on some organs of the body than on others. It was also shown that this general fact forms part of a law of much larger generality; namely, that all the common causes of disease, drugs being one, act locally. From this was derived as an inference, the therapeutic rule to give only those drugs as medicines which act on the organs in which the disease has its seat. The considerations so far passed in review belong to anatomy.

We have not yet gained all the knowledge necessary in order to prescribe a medicine. Let it be supposed that we have learned what part of the body is the seat of the disease to be treated; and that we are familiar with several drugs, for there are commonly several, which, in health, act upon the same part. We need, now, an answer to the question: Which of these drugs, having local actions on the diseased part, is to be chosen? This question cannot be answered without a knowledge of the *kind* of action of each of these drugs, as well as of the *seat* of their action. In our experiments in health we have seen that the seat of action of the same drug seldom varies in different experiments; when we notice the kind of action we see that this differs very much in different experiments. The kind of action of the same drug is not uniform. When we try to discover the cause of this difference, we suspect that it arises mainly from the variety in the doses or quantities of the drug used in the different experiments. So that we are now necessarily led into an examination of the subject of doses; whether their results differ; and if they differ, in what the difference consists.

How is this knowledge of the action of doses to be acquired? We have seen the benefit obtained from experiments with drugs in health; for we have already learned from them an important general fact or law of their action. Why not, then, pursue the same course with doses? Why not experiment on healthy persons with different quantities of the same drug, in order to find out the characteristic effects of each dose; as we have already experimented with different drugs, to discover the distinguishing action of each drug? This work was recommended ten or twelve years ago (Essay XVII.); and after some time, as no one else seemed inclined to undertake the task, it was attempted by myself, and the results were given in later essays.

By these experiments three general facts or laws, relative to the powers of different doses of the same drug, were discovered. Of course, these laws embrace the extent of doses only, within which the experiments were made; and nothing is affirmed of doses, whether greater or less, outside these limits. It was found that the doses thus experimented with may be arranged in three groups, each group expressing a law:—

1. A group of large doses which act on the organ or organs belonging to each drug as the seat of its action, in a certain manner, or with a determinate *kind* of action.

2. A group of small doses which act on the same part or parts in the contrary manner, or with the *opposite kind* of action.

3. A group of intermediate doses which at first have the one kind of action, and afterwards the contrary.

It would extend this paper beyond its proper limits were individual illustrations of these general facts to be given. They are to be found in former essays. It will be seen that the considerations involved in them belong to physiology. The earlier provers of drugs, including Hahnemann, in their experiments, used different doses; but the various and even contrary effects of these were put together in one list of symptoms, without preserving any distinction between the different doses. Later experimenters have, from time to time, noticed the contrary action of different doses of the same drug, with reference to individual substances; but it had not occurred to any one to recognise these individual or particular facts as belonging to a law.

It is manifest from these results, that the proving or experimenting with *doses* in health is as necessary as the proving of *drugs*. Different doses of the same drug act, not only in different, but in contrary directions. As in chemical combinations the results depend upon fixed quantities, so it is with doses of drugs. A uniform kind of action can be expected only from a uniform dose. As the seat of action depends upon the drug, so the kind of action depends upon the dose. That every drug should have a seat of action of its own in the living body is wonderful; yet this is what we are taught by experiments with them in health. That every drug should, in different doses, have two kinds of action, the one opposite to the other, in this seat of its own choosing, is perhaps still more wonderful; yet this also we learn from experiments in health. Drugs have a place to work in, and each drug has its own place; and when it is there, each has two kinds of work of its own to do.

We are now able to answer the question: Which of the drugs having local actions on the diseased part in the case to be treated is to be chosen? The answer is expressed in the following inference or rule, drawn from the laws which have been given above as governing the kind of action of drugs:—

The kind of action of the larger doses of the drug, when taken in health, must resemble that of the disease.

The reason for this rule will appear when the next question has been answered.

IV.—The Dose.

The dose given ought to belong to the group of small doses, which, in health, have a contrary action.

It is certain that nothing has been settled yet in any school of medicine, ancient or modern, about doses. The subject is a talking chaos, like the chirping of grasshoppers. Men have been deterred from the labour of observation by the prevalent notion that it is impossible to discover a law which governs doses. They have also excused themselves from that labour by the comparative ease of speculation; for to theorise is much less difficult than to observe. This confusion on the subject of doses will continue so long as we are guided, as we have hitherto been, by theories. The dogmatists and the methodists of old, the disciples of Cullen, of Brown, of Broussais in modern times, in short all who follow a theory in medicine, are misled by their own imaginations; they mistake fancies for facts; they are like somnambulists, walking about under the influence of dreams. Eclecticism is no improvement; it bestows no guiding principle, no profound convictions, nothing to bind its disciples one to another; its work is patchwork without a pattern.

There is another pernicious guide, which is a deadly foe to the improvement of medicine, this is fashion—some fashion set by a successful practitioner of the day; so that the picture of medical practice from season to season is like the figure in a kaleidoscope, which looks symmetrical and firm for the moment, presently another ardent spirit comes to the front, gives the tube a turn, the figure vanishes, and a fresh one takes its place—soon to be followed by another. It is humiliating to see to what extent fashion reigns in medicine. As of diseases, at one time every case is one of "liver," at another "congestion," then "neuralgia," then "fatty degeneration;" so of doses, every possible dose, from being large enough to kill, to being small enough to be imperceptible, is given. A view of the changes in doses for a few years only, is sufficient to convince any one that no certain rule is known. I hear someone exclaim: "We have posological tables!" Yes: and what is the rule by which they are constructed? The ludicrously feeble one of apportioning the doses of drugs to patients as you would sugar-plums to children, according to their ages! It is difficult to speak the truth upon this matter consistently with good manners and consistently with that deep respect for the medical profession which is truly felt.

Assuredly, it is high time that a more creditable practice was established; and it is the aim of this paper to point out the way by which this may be brought about. Hitherto doctors have looked only at diseases for indications, and they have looked at medicines with intentions. They have chosen drugs, and have fixed upon doses, which were supposed to meet these indications of the patient's disease, and to fulfil these intentions of their own. Whereas the true way is to look at drugs also; to note where they can act; and to note also what different doses of them can do.

To do this work the balance is required; for without weighing, and keeping separate the effects of each weight, nothing on this subject can be known with certainty. Everything in nature is governed by number, measure, and weight. God has counted, measured, and weighed all His works. Man's knowledges[1] are converted into sciences when they are guided by the same method. Mathematics, astronomy, mechanics, chemistry are sciences based upon facts ascertained by counting, measuring, and weighing. The balance in the hands of Cavendish, Lavoisier, Richter, Dalton, and Wollaston, has made a science of chemistry almost in our own time. Scientific chemistry had no existence before it was so studied. In like manner, the balance must be always in the hands of pharmacologists if they would have therapeutics become a science.

By pursuing this method under the most favourable, because least complicated, conditions—that is, with experiments in health—the laws which have been given above, as governing the phenomena caused by different doses of drugs, have been ascertained; and they may be received, at least provisionally, until better are discovered. They are so true that they may be followed in practice with safety and satisfaction.

We have seen that in order to prescribe a medicine for a patient it is required to know the answers to three questions: What drugs will act where the disease exists? Which of the drugs having this local action will produce a similar disease, when taken in health in large doses? What is the dose of the drug so chosen to be given as a remedy? The two former questions have been answered, and we are now able to reply to the third. The answer is expressed as an inference or rule drawn, like the second answer, from the laws which govern the actions of different doses of the same drug:—

The dose given ought to belong to the range of small doses, which, in health, have a contrary action.

Possibly a few illustrations of these rules may be permitted here, in order to make their meaning plainer. *Opium* has already been referred to. It's action on the brain is well known; and also that large doses cause sleep, torpor, apoplexy; while small doses have the contrary effect of excitement. The rules here given forbid the use of the large doses, and point to the small doses as a remedy in certain cases of coma and apoplexy. Opium in large doses contracts the pupils, in small ones dilates it; if, therefore, in a case of congestion of the brain there is a contracted pupil, this is an additional proof of the fitness of the small dose of opium; a dilated pupil would be evidence to the contrary. The action of *belladonna* on the pupil is known to be the opposite of that of opium; large doses dilate, and small doses contract the pupil; it is therefore a remedy for conditions the reverse of those requiring opium. *Aconite*, as every one knows, acts upon the heart, in large doses quickening its beats, in small doses slowing them. A few years ago, I experimented with aconite on my own heart so much that any desired effect could be obtained by apportioning the dose, with almost as much certainty as I could decompose sulphate of magnesia with chloride of barium, or produce any other common chemical effect. The plant grew in my garden. The tincture consisted half of the sap of the fresh plant and half of alcohol. With some doses the heart's beats could be increased, with smaller ones they could be diminished; and with intermediate doses, first one effect would follow, and then the opposite. At seventy-four, and with a heart much weakened by attacks of bronchitis, I must not offer to repeat these experiments now; but others ought to do so. They will remember that the actual doses each experimenter will require, to obtain these results, will vary within certain limits; but a general agreement will, I doubt not, be found. The expression in the laws is, that a certain " range " or " group " of larger and smaller doses act in a manner contrary to each other. *Digitalis* has been experimented with almost to the same extent, and with similarly precise results, but in a reverse order; *i.e.*, the large doses weaken the heart's force, the small ones strengthen it. Then, digitalis is never to be given to reduce the heart's action (aconite is the drug to do that), but in small doses digitalis is a cardiac tonic; in doing this work it is a master. Once more, drugs which are purgatives in large doses, constipate in small ones; consequently these small doses are the best remedies in diarrhœa. White hellebore (*veratrum album*), of which Hippocrates was so fond as a purgative, and which has been expelled from modern practice for its violence, is an admirable remedy in small doses, for cholera and diarrhœa. Every one knows what half an ounce of *castor oil* will do; in small doses it causes, in health, constipation (Essay XXXI.). In some cases of diarrhœa these small doses of castor oil are excellent remedies. On the contrary, drugs which, in large doses, constipate, as opium, lead, &c., are, in small doses, the best remedies for constipation; because, in health, in these small doses they promote the action of the bowels.

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[1] This word was in use in Lord Bacon's time; it is a more English word than *cognitions*, and deserves to be revived.

This is the bridge over the gulf which separates diseases from their remedies. It consists of two arches; experiments in health being the foundation of both. The first arch is local action; the spring of the arch on one side is the local action of the causes of disease, and on the other side the local action of drugs; the key-stone is the meeting of these in the same part of the body. The second arch is the contrary action of large and small doses; one spring of this arch is the action of large doses, the other is the action of small doses, the key-stone is the prescription of the small dose.

The general facts or laws which have been described in this paper are empirical knowledge, because we are ignorant of their causes. We can give no reason why drugs act locally, nor why large and small doses act contrary to each other. Such truths as these are called ultimate facts. The causes of them may some day be discovered. But we can give very sufficient reasons for the practical facts, or rules for prescribing drugs, which are inferences from these laws; this, therefore, is scientific knowledge. We give drugs as medicines which act where the disease is seated, because it is best to let well alone, and not to add to the disease already existing another of our own creating. Of the drugs which act upon the diseased part, we choose that which causes, in large doses, a similar morbid state, because we know that, in small doses, it will tend to cure the disease by acting contrary to it. And we give this drug in small doses because it is in these doses only that we know that it can act curatively.

Drugs act by the mechanical necessity of their laws; therefore they will necessarily tend to act in the same manner in disease as in health. Now, in health, small doses act in the contrary manner to large ones; it follows that if the large doses of a particular drug act in the same manner as the morbid process which is going on in a given patient, the small doses of that drug must tend to act in the opposite direction; and therefore must tend to counteract that morbid process; therefore this drug, in the small dose, must be the best remedy we can find.

This is a great revolution, but it is scientific and humane. It is not a revolution in medical politics, but only in medical practice. It necessitates no schism, for there is no heresy on either side. It belongs to the profession; for it belongs to that part of a medical man's duty which is exclusively his own, and for which he alone is responsible. It is so true and so beneficent that it is every medical man's duty to help to bring it about by every means in his power. This implies a state of transition for several years to come, in which there will be some confusion in the work done in practice. The reformation will, in the end, be perfected. In the meantime, until we have learned the true drug for the individual case we have to treat, we must fall back upon our former knowledge, and help our patient to the best of our ability.

The two remaining rules need not detain us:—

V.—*The drug must be given alone, otherwise its action will be interfered with, if not neutralised.*

This rule is so obvious that, were it not all but universally broken, it would imply a doubt of the sanity of the profession to give either an illustration of its meaning, or a proof of its necessity. Would that medical men remembered that every dose of medicine they give to their patients is as much an experiment as any which a chemist tries in his laboratory! Would that they watched the results and noted them with at least as much care as the scientific chemist does!

VI.—*When the desired effect has been obtained, the medicine must be discontinued.*

This rule is common sense also, and were it not so often disregarded it need not have been given. It is to be hoped that the time is coming when it would be an affront to any medical man to be reminded either of this or of the preceding rule.

There is also a time to stop giving a medicine when it is doing no good. How soon should a medicine be discontinued which is doing harm ?

Such are the rules for the use of medicines which were proposed in the *Practitioner* for May 1878. They have now been further explained. They are the result of a life-long study of therapeutics. The oyster had a rugged outside, and the shell has been hard to open ; but it is thought that the pearls found within are of great value, and as such they are commended to the acceptance of my profession.

[We have published these papers of Dr. Sharp's in the pages of the *Practitioner* because they direct attention to a most valuable means of forwarding therapeutics, viz., the investigation of the action of drugs by experiments with them on healthy persons. This mode of experiment is insufficient of itself to afford us the knowledge which is requisite for the rational treatment of disease. It must be combined with experiments upon animals (a mode of investigation which Dr. Sharp completely repudiates), for no observations of the action of drugs on man can enable us to analyze their mode of action. The conditions are too complex, and they must be artificially simplified. But, on the other hand, while we learn the *modus operandi* of drugs chiefly from experiments on animals, there are minute points in their action which can hardly be learned except by observations on man, and we hope that many young students and practitioners of medicine may be induced to take up the study, and thus further medical science. As there are many drugs which in small doses will produce an action the contrary of that which they produce in large ones, it is evident that homœopathy and antipathy are one and the same thing as regards drugs, and differ only in dose. The folly of all "pathies" is therefore self-evident; and it is equally plain that all those who hold them should acknowledge their mistake, and again join the main body of the profession who have throughout followed the right course, and have striven through all difficulties to find out rational methods of treatment based on an exact knowledge of pathology and pharmacology.]—Ed. *Pract.*

Reviews.

The Bearings of Chronic Disease of the Heart upon Pregnancy, Parturition, and Childbed, with Papers on Puerperal Pleuro-Pneumonia and Eclampsia. By ANGUS MACDONALD, M.A., M.D., &c., Lecturer on Midwifery in the Medical School of the Royal Infirmary, Edinburgh, &c. London: Churchill, 1878.

THIS book does credit to medicine, and particularly to the specialty with which its author is connected. His aims are high: "I hold the first duty of every obstetrician to make sure that he is a physician in the first instance, and an obstetrician only in the second place." But the readers of his book will be compelled to testify that his practice is equal to his principle.

It is the fault of specialists if knowledge of their specialty is held to imply ignorance of everything else. Such a book as that before us is invaluable as an example. Again, the sound of the jingle of money is conspicuous by its absence; we are bound to say this is a rare quality in books on a special subject. Dr. Macdonald does not appear before writing his book to have sat down and counted how much it was likely to bring him in. He appeals solely to the profession, and to that part of it which does not especially parade the word "practical."

For all that he will surely reap his reward in the certainty of having contributed to the advance of his science, in the recognition of the best part of his professional brethren, and we doubt not in future work, which will look to him as the pioneer in a most interesting inquiry.

This book ought to be procured, or at least read, by all who ever see a pregnant, parturient, or puerperal patient. We venture to add that its importance is quite as great to the general as to the obstetric physician, as he is debarred from the opportunities of special observation enjoyed by the latter, and turned to such excellent account in the book before us.

Papers on the Female Perineum. By J. MATTHEWS DUNCAN, M.D., &c., &c., Obstetric Physician to St. Bartholomew's Hospital. London: Churchill, 1879.

OF this book it is sufficient to say that it is worthy of the reputation of the author. Dealing with a subject handled in all text-books, but in general superficially only—most authors seeming to be content with simple compiling, and never bringing their statements to the bar of exact inquiry—he takes each part of his subject, looks it well in the face, and dissects it. The results are most valuable; the first chapter on the anatomy of the part is a model of sceptical exactness, and contains many points undeniably true, but almost never taught. The chapters on Lacerations are full of valuable and suggestive facts, and make us regret the great waste of material in our Lying-in Hospitals. It is curious (p. 29) that in cases of second as well as first cranial presentations, the majority of lesions were on the left side. This makes us think again before we accept the usual explanation.

We are disposed to disagree with the recommendation of a boxwood disc and stem pessary; these procident uteri occur as a rule when patients are well on in life; it is then too late to learn a manœuvre such as is necessary for the removal and replacement of such an instrument, besides which these patients are nervous of tearing and injuring themselves. The end is likely to be that the pessary, once in, remains in, and the consequences are at least awkward. Any pessary ought to be capable of easy removal and replacement, and should, if possible, require only such manipulation as is already well known to the patient.

We conclude by expressing our sense of the great value of this small but very pregnant volume.

The Action of Medicines. By ISAAC OTT, A.M., M.D., 8vo. pp. 168. Philadelphia: Lindsay and Blackiston.

SO much has been made out of late years by the experimental investigation of the action of medicines, that a desire to become acquainted with the methods followed in experimental researches has arisen, even amongst those who have no opportunity of undertaking by themselves any experimental investigation. Such a knowledge is still more desirable, indeed it is absolutely indispensable, to those who undertake researches of their own.

In order to supply this want we published some lectures some years ago on the experimental investigation of the action of medicines, but these did not extend beyond the methods applied to the investigation of the action of drugs on the circulation. Some time afterwards a work by Professor Hermann appeared on "Experimental Toxicology," in which the investigation of the action of drugs on all the functions of the body was dealt with, and, in addition, a list of the most important drugs was given, with an account of the actions possessed by each. The present work is constructed somewhat on the same plan as Hermann's, but is much smaller. It is illustrated with diagrams, which are of considerable service in enabling the student to form a correct idea of the instruments used and the mode of operating. It is, however, rather too brief, so that the directions contained in it are occasionally of no use whatever, and sometimes these are such as to indicate that the writer has no practical acquaintance with the particular mode of experiment. To those, however, who are unable to read German, and to whom the larger works on this subject are inaccessible, this book may prove useful.

Clinic of the Month.

The Treatment of Whooping-Cough by Atropia.—Mr. Wigglesworth has been led to use atropia in cases of whooping-cough in preference to belladonna as recommended by M. Trousseau. He finds that the alkaloid is the more useful because of its unvarying strength, because the dose could be more easily regulated, and lastly because it is nearly tasteless. He administers the solution of the sulphate of atropia (B.P.), which contains $\frac{1}{120}$th of a grain, in each minim before breakfast, increasing or diminishing the dose as occasion requires. He finds that in children from one to four years of age a single minim of the solution is sufficient; except in severe cases this is only ordered once a day, but when the nightly paroxysms are very severe, half the dose is to be repeated before bedtime. The results that follow its administration may be summed up thus: 1st. There is a steady diminution in the *number* of paroxysms; 2nd. There is a diminution in the *duration* of the paroxysms; 3rdly. There is a change in the character of the "whoop," as if the vocal cords were not so closely approximated. Further, if the atropia is withheld, the beneficial effects derived from it subside. These results follow, more or less speedily, the administration of the remedy, and appear to depend upon the susceptibility of the patient to the action of atropia. In a few cases thirst may become a prominent symptom, which subsides, however, upon a diminution of the dose. In only one case has the sensation of "falling down" been experienced, and this disappeared with a reduction in quantity. (*The Lancet*, April 12, 1879.)

Codeia as a Sedative.—Dr. Saundby says that no symptom is more distressing to a patient than frequent coughing, and that none demands more judicious treatment on the part of the practitioner, if he would avoid undoing with his cough mixtures all the good he is attempting by his more general therapeutic measures. In phthisis the presence of anorexia makes us unwilling to give opium or morphia, and frequently when we do so we have reason to regret it. Many patients, and especially gouty subjects, and those who suffer much from derangement of the liver, are intolerant of opium and morphia. On account of these difficulties the author has been led to employ codeia in such cases, in the hope that it might be of service, and it has succeeded beyond his expectations. In phthisis it allays cough without disturbing the digestive system, and in the other class of cases he has found it tolerated where opium and morphia were not. As an instance of the latter he quotes the case of a medical friend, a member of a gouty family, a frequent sufferer from migraine and derangement of the liver, and well aware of his intolerance of preparations of opium. He complained of a troublesome cough, depending on slight catarrh of the trachea and bronchi; the administration of codeia afforded all the benefit and none of the ill effects of opium. The drug is prescribed in doses of a grain, dissolved in syrup of tolu. (*British Medical Journal,* April 12, 1879.)

Oleate of Zinc in Eczema.—Dr. Sawyer records his testimony in favour of the efficacy of the ointment of oleate of zinc in the treatment of eczema. He has used the remedy for nearly six months in a large number of cases arising in hospital and private practice. The author has always used the oleate of zinc made into an ointment, either with vaselin or with lard. The preparation with vaselin he has employed in private practice, and that with lard on account of its comparative cheapness, for the hospital patients. Vaselin is preferable to lard, because it is not so liable to change, and because the greasiness of the lard injures the clothes of the patient, and sometimes disagrees with the skin. The ointment made with vaselin may be rendered more " elegant " by the addition of one drop of otto of roses to each ounce. The oleate of zinc ointment is also said to be serviceable in the treatment of eczema, and more particularly of eczema capitis of children. (*Ibid.,* April 19, 1879.)

Hydrobromic Acid.—Dr. Squibb advocates a process for preparing hydrobromic acid from bromide of potassium and sulphuric acid, which he finds to be more convenient and to yield a purer product than Dr. Fothergill's method. The acid is on its trial as a sedative neurotic, and as a substitute for the alkaline bromides, but a serious drawback to its administration in full doses is the degree of dilution rendered necessary by its sharp biting taste. A dose of 50 grams (41·6 minims) of Dr. Squibb's solution, equivalent to 25 grs. of bromide of potassium, requires not less than ℥viij of liquid, containing at least an ounce of sugar in solution. Dr. Fothergill, however, employs the acid in smaller doses, and holds it in high esteem. (*The Dublin Medical Journal*, April, 1879.)

Tetanus treated by Chloral Hydrate.—Dr. Peele records a case of tetanus which he has successfully treated by means of hydrate of chloral. The patient, aged six years, had suffered a slight injury to his foot. The symptoms first showed themselves after a period of seven to nine days. The attack therefore came on with moderate rapidity, and was not wanting in severity. The risus sardonicus was well marked, as well as opisthotonos in the earlier period of the disease. Under treatment with hydrate of chloral in six-grain doses four times a day, the opisthotonos gave way to emprosthotonos. The dose of chloral was then increased to eight grains, when the emprosthotonos disappeared, though the muscles generally continued stiff and hard, whilst the risus still remained, though not to so marked an extent as before. As appears to be somewhat usual in cases of tetanus, the author remarks that the diaphragm was first attacked. In this case the disease was of a unilateral character, so far at least as the right foot and leg were concerned, the rest of the body being equally affected on both sides. (*Ibid.*)

Chaulmugra Oil.—The following extract has been made from a recent paper by Mr. C. Moss in answer to some questions as to the mode of using and prescribing chaulmugra oil in cases of scrofula and skin affections. Being a solid in our latitude, it must be melted before measuring out the five to fifteen drops, forming a dose, which is sometimes taken on sugar. Here are two objections. In the first place this, like other alterative medicines, has generally to be taken for a considerable period, and to warm the bottle regularly three or four times a day in order to get out the dose, besides being inconvenient in itself, is trying to the patience: in the second place the unpleasant taste and smell remain without amelioration. To obviate these objections, it is suggested that chaulmugra be given in the form of capsules or pills holding the minimum dose—from three to four grains. In this form the dose is already divided, and neither taste nor smell can be perceived by those taking it. For external application the oil is already in a convenient form, and for the ease and smoothness with which it rubs over any surface where this mode of using it is permissible, it has been likened to goose grease. To parts which are very sore, and hence cannot be rubbed, it should be softened by warmth and applied lightly with a soft brush. A more economical way of using the chaulmugra is in the form of ointment, and a satisfactory formula for this is as follows: chaulmugra oil two parts; paraffin wax (106° F.) one part, ozokerin 5 parts. (*The British Medical Journal,* April 26, 1879.)

The Treatment of Neuralgia.—Aconite is an old remedy in neuralgia, which has, however, not altogether realised the expectations which were formed of its value. The power which it often lacks has been lately claimed for its alkaloid by Prof. Gubler, who announced that aconitia is almost infallible in trigeminal neuralgia. This substance was long banished from the *Materia Medica*, for internal use, but it has been employed occasionally since the discovery of a crystallised form by Gréhant and Duquesnel in 1871. Its value in neuralgia has lately been investigated by the New York committee on neurotics, of which Dr. E. C. Seguin is the chairman. The dose of all forms of aconitia is about the same, the initial dose being about half a milligramme ($\frac{1}{100}$ grain) twice or thrice a day. Gubler states that the dose of amorphous aconitia may be gradually raised to half a centigramme, but Duquesnel's preparation has to be given with greater caution. There are, however, differences in susceptibility, and some persons cannot bear a larger dose than $\frac{1}{200}$ of a grain, while one case was met with in which $\frac{1}{84}$ of a grain every three hours was tolerated. From a trial of the treatment in a series of cases, the committee conclude that, on the average, distinct physiological and therapeutical effects may be obtained by giving $\frac{1}{100}$ of a grain three times a day. Of six cases of severe trigeminal neuralgia, one, probably of reflex origin from a decayed tooth, was not at all benefited. Three cases of epileptiform neuralgia were slightly or only temporarily relieved. Two cases were cured, one of these had existed for seven years, with an interruption of seven months, procured by resection of the affected nerve. The results thus afford a partial support to M. Gubler's assertion.

The value of ammoniacal sulphate of copper in the treatment of the same affection has been asserted by M. Feréol in a recent communication to the Académie de Médecine. He states that in cases in which every treatment has failed, even the administration of gelseminum and of aconitia, a cure or remarkable relief may be obtained to the most severe symptoms by this drug. Among the examples he gave of its use are the following: Trifacial neuralgia of two months' duration with absolute (?) insomnia, was unrelieved by the extraction of teeth, quinine, bromide, aconitia, or tincture of gelseminum, hypodermic injections of morphia, or arsenic. From the first day of the administration of the ammonio-sulphate of copper there was a notable remission in the symptoms and cessation of the insomnia. In one case the dose was pushed to eight grains without any other accident than nausea. It has the drawback of occasioning a persistent metallic taste in the mouth. Only one case of intolerance was met with; in that a grain and a half of sulphate of copper occasioned violent vomiting. (*The Lancet*, April 26, 1879.)

Dyspepsia.—Dr. Leared believes that in the larger number of dyspeptic cases the lesion is not one of secretion, but of the proper movements of the stomach, for whenever the contractile movements of the stomach are considerably lessened, flatulent distension soon follows. For this there are two reasons: first, the food lies passive, or nearly so, in the lowest parts of the stomach, where it is so slowly reduced that it undergoes a process of fermentation ; secondly, the relaxed organ becomes filled with the gases thus evolved, and probably also with gases regurgitated from the small intestine. In this form of dyspepsia, therefore, flatulence is not only a leading symptom, but it forms a valuable aid in diagnosis. A great evil arising from flatulence is, that frequent distension of the stomach by stretching its muscular fibres impairs their tonicity more and more. The evil is thus propagated in a circle; because whilst relaxation in the first instance is the cause of flatulence, this, in its turn, becomes a cause of relaxation. Extreme dilatation of the stomach implies that its peristaltic movements are in abeyance, soft and semi-liquid food can alone be taken, and this is either rejected in part daily, or at longer intervals, when the accumulated mass has fermented ; and then, in addition to the common yeast plant, *sarcinæ ventriculi* are developed. The author therefore proposes to divide dyspepsia into two classes: in the one the cause is impaired motion; whilst the other is due to defects of secretion. In dyspepsia of the former class there is uneasiness in the stomach after meals, which is variously described as a sense of weight, fulness, and pressure. Constipation is almost always present, but gastric pain is unfrequent. The causes of impaired peristalsis may be summed up as those by which nervous energy in general is impaired. Such causes are hard study, mental strain, depressing passions, prolonged bodily fatigue. To maintain its vigour the stomach requires absolute rest at regular intervals, and for this purpose must be empty. The practice of eating too frequently, or at irregular intervals is, therefore, a common cause of dyspepsia from impaired motion. In the treatment of all forms of dyspepsia attention to diet claims a prominent place. Articles known to be slow of digestion must be avoided, a lessened amount of food must be taken, and only at proper times. The principal meal should be taken early in the day, before the nervous system has been exhausted by nervous or bodily exertion. Strychnia is of great value in impaired gastric peristalsis, but care must be used in its administration, and a dose of $\frac{1}{20}$th of a grain should be but rarely exceeded. It should never be given in the form of pill. Thymol has been found useful in checking flatulence by hindering fermentation, and charcoal capsules are recommended for the absorption of the gases when the stomach is unable to expel flatulency in consequence of temporary paralysis from over-distention. (*The British Medical Journal*, April-May, 1879.)

The Hæmatocytometer in Anæmia.—Dr. Hunt is able, from an extended use of the hæmatocytometer, to confirm the ordinary estimate of the number of coloured corpuscles in a cubic millimetre of blood, viz., 5,000,000. He also finds that 1,500 white blood corpuscles is the ordinary maximum number in the same space. In ten cases of anæmia which have been carefully followed, the average of the red corpuscles at the commencement of the disease was less than 62 per cent.; in the three worst cases the average was less than 46 per cent.; and in the most severe case it was 42 per cent. None of the patients, however, were laid up by the disease; they were all young girls employed in sedentary occupations. In an apparently bad case of anæmia complicated with hysteria, the hæmatocytometer showed that the number of corpuscles were not much below the normal, so that the case was evidently not one of true anæmia. Under appropriate treatment the patient was, to all intents and purposes, well in a fortnight. Dr. Hunt has also found that the corpuscles reach the ordinary amount some time before the patient's symptoms have disappeared, or the normal colour returned. This result is generally attained in about three weeks. The condition of the heart, in most of the cases, proved the severity of the disease. In the majority there was well-marked dilatation, as expressed by the character of the impulse and the increased lateral dulness. Mitral systolic murmurs were not infrequent, and carotid murmurs were heard in each case. These signs all improved under treatment *pari passu* with the increase in number of the corpuscles, and previous to any marked change in the outward appearance of the patient. The effects of the catamenia are discussed, and the author's observations tend to show that the increase in the number of corpuscles ceases at each period. The treatment which has been pursued consists in the administration of good plain nourishing food without stimulants, open-air exercise, a cold bath in the morning, when practicable, together with half-an-ounce to an ounce of compound iron mixture thrice a day, an aperient every night, generally five grains of iron-with-aloes pill, or aloes-with-myrrh pill. It was also observed that white corpuscles were not reduced in anything like the same proportion in the course of the disease, but were generally about the normal number, whilst their number was far less affected by the treatment pursued than that of the red corpuscles. (*The Lancet*, May 10, 1879.)

The Treatment of Ague by Quinetum Sulphate.—Dr. Hollis confirms Dr. Vinkhuyson's experience in regard to the good effects of quinetum in the treatment of ague. He finds that a dose of quinetum sulphate, of from ten to fifteen grains, is almost invariably sufficient of itself to stop the course of a febrile intermittent. In two cases out of twelve, in which it failed to do so, the subsequent administration of quinine was likewise without effect. Dr. Hollis therefore concludes that quinetum sulphate is a valuable anti-periodic remedy second only to quinine. The drug is scarcely half the price of quinine, and is therefore recommended to the favourable consideration of the medical staff of hospitals, and other charitable institutions, where economy is, or ought to be, particularly practised. Sulphate of quinetum is a white flocculent substance consisting of numerous fine acicular crystals, bitter in flavour, and readily soluble in acidulated water. It represents the whole of the alkaloids of the cinchona succirubra bark. It contains quinine sulphate, cinchonidin sulphate, and cinchonin sulphate in the proportions of 25·30, 50·55, and 20·25 per cent. respectively. The variations of the alkaloids rarely range to the extent of 5 per cent., a fact of some importance in estimating the therapeutic value of the drug. (*The British Medical Journal*, May 10, 1879.)

On the Arrest of Bleeding from Internal Organs.—Dr. Dougall discusses the various ways in which, during hæmorrhage, nature stops the bleeding, viz., the alterations which are set up in and around the bleeding vessel; the slowing of the heart's action and consequent lowering of the blood-pressure; and the changes in the effused blood. From a consideration of these phenomena he concludes that the physician should use such remedies as are known to contract the vessels, to lower the blood-pressure, and to thicken the blood. Of the agents that contract the vessels cold and ergot are the chief, whilst the blood-pressure may be reduced either by placing the body horizontally, or by the use of veratrum viride, aconite, and antimony. Of the latter drugs veratrum appears to be the best, as it is prompt and certain in its action, and is not cumulative. It does not change the character of the blood, rarely purges, and its effects soon subside when its use is suspended. Antimony, in the form of a tartrate, may also be used to lessen the force and volume of the circulatory current, for it appears to act directly on the heart muscle or on its ganglia, as it lessens the pulsations of the excised frog's heart, and finally stops it in diastole. Tannic acid is used as an agent for thickening the blood, as are also nitric and hydrochloric acids, acetate of lead, creosote, and alum. Sulphuric and acetic acids, tincture and liquor of the perchloride and sulphate of iron, alum, and phosphoric acid, as well as turpentine, are, for various reasons, not treated of as remedies for administration in cases of hæmorrhage, although, as astringents, they undoubtedly assist in arresting the flow of blood. Dr. Dougall also recommends that attention should also be paid to the diet, regulation of the bowels, and careful ventilation of the patient's room, and those other minor points upon which so much of the care depends. (*The Glasgow Medical Journal,* May, 1879.)

Mistura Guaiaci in clear Solution.—Dr. Balmanno Squire has attempted to destroy the unpleasant taste of guaiacum and to make its appearance somewhat more attractive. For this purpose he tried a mixture formed by rubbing down ten grains of guaiacum with twenty minims of liquor potassiæ; but the guaiacum was precipitated, and the mixture was consequently useless. A mixture of tincture of guaiacum with glycerin, in equal parts, resulted in a perfectly clear solution. More glycerin was added, and the solution still remained perfectly clear. The pungent and nauseating effect of the guaiacum is thus rendered considerably softer, and altogether less objectionable. Another convenience is a diminution of the necessary bulk of the dose, which may be reduced within the capacity of a liqueur glass. An objection may arise, viz., that even if its flavour be rendered milder, the remedy must nevertheless be continued in this diminished bulk of fluid in a higher state of concentration, so that when the compound is mixed with the fluids of the stomach this fact will become manifest; but it is not so. The action of a glycerin solution on the tissues is much more gradually exerted than that of an aqueous one, as may be observed by comparing the effect on a sore throat after painting it, at one time with the glycerin of tannic acid, and at another with an equivalent aqueous solution of the acid, or by trying on a patch of slightly raw skin an aqueous against a glycerin solution of iodine of corresponding strength. Dr. Squire therefore proposes the admixture of half a drachm or a drachm of the tincture of guaiacum, with one or two drachms of glycerin, for a dose. He makes use of a rectified spirit tincture, and not the ammoniated tincture of the *Pharmacopœia,* and he finds that the guiacum itself is insoluble in glycerin. The mixture of the tincture with glycerin will not bear dilution with water, which renders it turbid. If it has to be diluted, therefore, glycerin must be alone used. (*The British Medical Journal,* May 17, 1879.)

Extracts from British and Foreign Journals.

Prophylaxis of Hemiplegia.—Dr. Thompson observes that apoplectic hemiplegia requires for its proper understanding not so much a minute acquaintance with the localisation of nerve centres and their functions, as a knowledge of the effects, for example, of disorders of the kidneys upon the textures of the arteries. Thus, in syphilitic hemiplegia it is not the nerves but rather the connective tissue, or else the membranes of the brain, which are involved and from which the entire trouble proceeds, producing nervous symptoms either by exudation or effusion. Hence in most paralyses the nervous lesion is secondary to primary disease elsewhere. The author then proceeds to discuss briefly embolic, syphilitic, and vascular hemiplegia. In relation to the syphilitic form, it is said that hemiplegia is almost always preceded by significant symptoms, valuable both for diagnosis and treatment. Of these the most important and constant is headache, both preceding and following the attack. It differs from the slight temporary headaches which may presage vascular hemiplegia in being far more constant and severe, and in being generally worse at night. Another common symptom is that of slight, usually transient, local paralyses occurring in different portions of the body. Another peculiarity of syphilitic hemiplegia is that it may develop slowly, whilst it often occurs without loss of consciousness. Sometimes, however, it begins with, or is preceded by, an epileptic fit or fits. Like other syphilitic neuroses, hemiplegia is a late manifestation of that disease, often only after years have elapsed since the primary infection, which, moreover, may have had but slight secondary symptoms following it. Iodide of potassium should, of course, be used unsparingly from drachm doses upwards, with $\frac{1}{20}$ gr. doses of corrosive sublimate, whilst to sustain the patient against the iodide,

℞ Ac. phosphor. dil. ʒvi.
Syr. hypophosphit. ad ℥iv. M.
S. Two teaspoonfuls in water t. i. d.

is recommended.—(*The New York Med. Rec.* Nov. 16, 1878.)

Treatment of Dyspepsia.—Amongst drugs arsenic in small doses gradually increased, is a remedy of extreme importance. Where there is torpor of digestion joined with very marked sympathetic nervous disturbances, the following prescriptions are of great value:

℞ Sodæ bicarbon. ʒiij.
Acid hydrocyan. dil. gtt. xlviii.
Tinct. valerian. f ℥j.
Syrup. zingiberis, f ℥ij. M.
Sig. A teaspoonful thrice daily in water.
Quiniæ sulph. gr. xvi.
Strychniæ sulph. gr. $\frac{1}{3}$.
Acid muriat. dil. f ʒjss.
Syrup zingiberis, q. s. ad ℥iv. M.
Sig. Two teaspoonfuls in water directly after meals.

Where there is marked hepatic disturbance the following prescriptions are excellent:

Acid muriat. dil. f ʒss.
Tinct. nuc. vom. f ʒss.
Comp. infus. gentian, q. s. ad f ℥iv. M.
Sig. A teaspoonful in water after meals.
Bismuth. subnit. ʒjss.
Pepsinæ, ʒjss.
Strychn. sulph. gr. j.
Tinct. cardamom. comp. q. s. ad. f ℥iv. M.
Sig. A teaspoonful thrice daily in water.

If there is much flatulence an increase is made in the quantity of bismuth and pepsin. If the case be merely one of gastric atony the amount of strychnia is increased. Where there is marked gastralgia, two to five drops of Fowler's solution are administered during the paroxysms. If this does not control the pain, a blister two inches square is applied to the epigastrium, and followed by a belladonna plaster six inches square. Where the stomach is weak, its muscular action impaired, and its nerves over sensitive, but little food should be taken into it at a time. The best diet is skimmed milk half-a-pint every four hours. When milk is not well digested, lime water is to be combined with it. Such foods as coffee, tea, and tobacco must of course be given up absolutely and at once. A sovereign article of diet is buttermilk. In buttermilk the casein of milk is coagulated and broken up, so that the stomach is spared two steps of the regular process of digestion. Another excellent preparation of milk is koumyss. It contains a good deal of carbonic acid. In all cases the work of the stomach should be rendered lighter by a diet consisting of eggs, milk, starchy vegetables, stewed fruits, and a little butter, with stale bread.—(*Ibid.*, Nov. 16, 1878.)

Treatment of Burns and Scalds.—Mr. Waters applies to the scalded surface bicarbonate of soda in fine powder, if it is a wet surface ; but if it is a dry burn, he recommends a paste of bicarbonate of soda and water, or a strong solution of the bicarbonate of soda in water, to be applied to the burned surface. This application relieves sunburns as well as burns from hot coals, melted sulphur, hot iron, steam, &c. It is important, says Mr. Waters, always so to dispose the scalded surface that the blood can gravitate towards the heart, as otherwise a continuous pain may be felt, due to the dilatation of the blood-vessels from the weight of the contained blood. If bicarbonate of soda is not at hand, bicarbonate of potash is the next best ; biborate of soda does as well, but it is not often obtainable. The emulsion of lime water with oil makes a good dressing where the skin is broken. But vaselin is preferable, as there is no odour from it, and it is quite bland. In order to produce the desired effect with sodium bicarbonate, it is necessary to use a saturated solution, one part to six, or thereabouts, and to apply it on lint or other suitable dressing. This in many cases gives almost instantaneous relief. (*The Cincinnati Medical News*, July, 1878.)

Poisoning by Carbolic Acid.—A case of acute carbolic acid poisoning from peritoneal absorption is reported to have taken place in a woman, aged 31, who was using a 1 per cent. solution of carbolic acid daily for the purpose of washing out the uterus, after the enucleation of a large retrocervical fibroid tumour. The solution thus used obtained an entry into the peritoneum, without the exact cause being discovered. There ensued loss of consciousness with tonic cramps of the extremities ; the face became very pale, and covered with a cold sweat, the respiration was first suspended, it was then superficial, and was finally slowed. The pulse was not counted. Consciousness returned in four hours. The symptoms of irritation of the walls of the peritoneum ceased, though the patient suffered for several days from catarrh of the bladder, as the sole result of the poisoning. (*Deutsch. med. Wochensch.*, 1878, No. 15. *Centralbl. f. med. Wiss.*, Sept. 7, 1878.)

Treatment of Shock.—Dr. Hunter has lately introduced a new and successful method of treatment for the general shock following railway injuries, &c. The patient is at once placed in bath of 98° F. ; the temperature of the bath is then rapidly raised to 110° F. As is well known, the temperature of patients suffering from shock is as low as 96° in the armpit. By this method of treatment Dr. Hunter has been able to raise the temperature of the patient from 96° to 98·5°, and to reduce the number of respirations from 36 to 20 in the minute. Before the bath the skin is cold and clammy ; on taking the patient out it is warm and dry. The patient is left in the bath from ten to fifteen minutes. This treatment has been followed in a number of recent cases in the surgical wards of the University Hospital of Pennsylvania. (*The New York Medical Record*, Jan. 11, 1879.)

Antidote for Arsenite of Soda.—The ordinary antidote for arsenious acid (hydrated sesquioxide of iron) is wholly inefficacious in poisoning by the arsenites of soda and potash. The antidote to the latter is formed by the mixture of a solution of sesquichloride of iron and the oxide of magnesium. This mixture also answers for arsenious acid, and should consequently always be preferred in cases of arsenic poisoning. Give the officinal sol. ferri sesquichlor., and afterwards the magnesia. Give a cathartic an hour after the antidote. Avoid all acid drinks. (*Ibid.*)

Method for the Rapid Relief of Pain after the Application of Copper Sulphate.—Dr. Carl Pick has noticed that the application of sulphate of copper to the conjunctiva causes severe pain. In conjunctivitis blennorrhoica this application has to be made daily for several months. It has occurred to the author by a lucky chance that calomel may be of use to relieve the pain. He therefore proceeds as follows. He applies the bluestone in the ordinary way to the conjunctiva, and after an interval of four or five minutes he sprinkles a little calomel over the places where the application has been made. The pain immediately disappears. After adopting this method for five or six days the calomel may be used directly after the application of the sulphate of copper, when the pain will disappear instantly. The author is unable to give any reason for the disappearance of the pain under these circumstances. (*Centralblatt f. med. Wiss.*, No. 45, 1878.)

Treatment of Facial Neuralgia by Aconitin.—Prof. Gubler states that he has never met with a case of neuralgia of the fifth nerve, even tic douloureux, which failed to yield to aconitin. A man on whom Nelaton had performed the operation of resection of the nerve for violent neuralgia, with only temporary improvement, was entirely cured by aconitin, of which he took $\frac{1}{14}$ of a grain. Hottot's preparation of the nitrate of aconitin is the best to use; the dose is $\frac{1}{140}$ of a grain which contains $\frac{1}{280}$ of a grain of aconitin. When this quantity fails to produce the desired effect, the doses may be increased up to $\frac{1}{12}$ of a grain. Heart disease absolutely counter-indicates the drug. (*Med.-chir. Rundschau*, Aug. 1878; *The New York Med. Record*, Dec. 28, 1878.)

The Elimination of Antimony from the System.—Dr. Morton has been engaged upon a series of experiments for the purpose of determining certain points connected with the elimination of antimony from the human system. In order to secure material for analysis, tartar emetic, in half-grain doses, was administered every evening about ten o'clock, for three successive days. The urine discharged was collected in two portions for each twenty-four hours, one being that discharged at rising in the morning, and the other consisting of the rest discharged at various times during the day and evening. An analysis of this fluid was made by evaporating it to one-third its bulk, precipitating it with sulphuretted hydrogen, and getting rid of all chlorides. The results obtained indicated that antimony when swallowed even in minute doses is very promptly eliminated in part by the kidneys, and continues to be so eliminated constantly. With such small doses as were employed in these experiments it is not likely that the elimination could have been traced much further than' was done, viz., for five days after the last dose. The rate of elimination during these five days was steadily decreasing: whatever was the state of combination of the antimony on its elimination, it certainly was one which offered no obstruction to its precipitation by sulphuretted hydrogen in the ordinary manner. (*The American Journ. of Med. Sci.*, Jan. 1879.)

Cerebral Apoplexy.—M. Raymond communicates the case of a young man who suffered from a sudden attack of apoplexy, which was followed, not by hemiplegia, but by brachial monoplegia, which extended to the shoulder, and was accompanied by total loss of sensibility. He also noticed certain vaso-motor troubles; if the skin was rubbed rather strongly urticaria was easily caused. Metallotherapy and electricity were tried for several months without effect. Under the care of M. Vulpian, however, he was submitted to a daily course of electricity which was of short duration. The induced currents were applied to the arm. Under this treatment, sensation and motion partially returned. M. Laborde asked whether this case was not simply one of traumatic paralysis of the kind which is sometimes observed in children. M. Raymond replied that the notes were most exact, the patient had lost consciousness, there was no ecchymosis, and no trace of a bruise upon the arm. Moreover, in spite of the persistence of the paralysis for several months, there had not been any muscular atrophy of the arm. The seat of the lesion was difficult to diagnose, when the distance of the sensory from the motor centre in the brain for the arm was taken into consideration. On this account he was unable to correlate the facts. (*Le Praticien*, Feb. 3, 1879.)

The Effects of Jaborandi and Pilocarpin upon the Eye.—Dr. Königshofer has employed the infusion of jaborandi for internal administration, the extract as a local application, and pilocarpin both subcutaneously and locally. The effects of jaborandi when administered internally in the form of infusion are as follows:—1. There is tension of accommodation manifesting itself by a recession of the far and near points. 2. There is the invasion of phenomena like glistening scotomata. 3. There is a slight increase of the lachrymal secretion. No contraction of the pupil, nor diminution in the power of vision was observed. The general results arrived at from the use of the drugs was, that alcoholic and aqueous extracts of jaborandi, apart from their purely mechanical irritation of the conjunctiva, exercised no effect whatever upon the eye. The potential elements of jaborandi are not contained in both extracts. Infusion of jaborandi internally administered occasioned a moderate degree of spasm of accommodation, with recession of the near point, and glistening scotomata. The lachrymal secretion was somewhat increased. The muriate of pilocarpin, applied locally, occasioned a high degree of myosis and a slight degree of spasm of accommodation, but injected subcutaneously a high degree of spasm of accommodation, and a slight degree of myosis, with recession of the near point, and hypersecretion of tears. No diminution of the acuteness of vision, under any mode of experimentation, could be detected. (*The Saint Louis Med. and Surg. Journ.*, Nov. 1878.)

Treatment of Whooping-Cough with Carbolic Acid.—Dr. Thorner has treated successfully sixteen cases of whooping-cough by means of carbolic acid inhalations. In the case of older children he makes them breathe a 1 or 2 per cent. solution at a distance of about a meter from the end of an ordinary inhaling apparatus, whose globe has a capacity of about 80. In the case of smaller children, however, the author has found it best to keep them in a small room for about twenty minutes, the windows and doors of which have been previously closed, and in which two or three glasses of the acid have been sprinkled. (*Centralblatt f. med. Wiss.*, March 8, 1879.)

Treatment of Chronic Ulcers of the Leg by Means of Tension Sutures.—By means of an assistant the upper and lower borders of the ulcer are raised in the longitudinal direction so as to form a flap, which is drawn away from the underlying part by strong traction. A straight needle with a carbolised thread is passed through about three-quarters of a centimetre above the upper margin of the ulcer as far as the base of the flap; it is then withdrawn for about two millimetres, and the ends are tied; by this means the flap of skin is fixed. A similar suture is passed through about three-quarters of a centimetre below the lower edge of the ulcer. The sutures are withdrawn after a period of 40-50 hours. The flap slowly returns to its original position, the parts perforated by the stitches fester and form a somewhat necrosed subcutaneous tissue. The resulting cicatrix contracts and the ulcer is permanently stretched. (*Berliner klin. Wochenschr.*, No. 45, 1878. *Cbl. f. med. Wiss.*, March 1, 1879.)

Use of Disinfecting Injections into the Uterus after Delivery.—Drs. Küstner and Fritsch have (*Centralblatt f. Gynækologie*, xiv. 16) called attention to the danger which is liable to follow a too free use of disinfectants in washing out the cavity of the uterus after delivery. In the cases observed by these writers the symptoms were unmistakably those of acute poisoning. Dr. Küstner's case proved fatal, and at the autopsy it appeared that the uterus itself had not in any way been injured by the introduction of the syringe. Yet there had been suddenly developed unconsciousness, contraction of the pupils of the eyes, rapid respiration, dyspnœa, and a weak and scarcely perceptible pulse. The muscles of the face were convulsed, the head was thrown backwards, the jaws were fixed, and a cold sweat covered the patient. In fourteen to fifteen minutes the patient improved considerably. Half an hour later the patient vomited a black vomit, and the urine drawn off by the catheter was black. The disinfecting solution used in this case was one part of carbolic acid to twenty of water. Dr. Fritsch reports three cases in which most dangerous symptoms arose. In one of these cases the disinfectant used was salicylic acid, and in two carbolic acid. In all of them there was a sudden collapse, followed by unconsciousness and a very rapid pulse. In the two cases in which the carbolic acid had been used there was observed the same discoloration of the urine. These three cases recovered. In all of them the uterus was imperfectly contracted. Both observers regarded these symptoms as due to the very rapid poisoning of the patient by the entrance of the disinfecting agent into the circulation through the patulous sinuses of the imperfectly contracted uterus. They still, however, strongly favour the use of a disinfecting irrigation of the puerperal uterus in all cases in which the attendant has reason to suspect any putrid absorption, but they both recommend that, in all such cases, the injection should be performed with the greatest care, and that especially the introduction of a forcible stream should always be carefully avoided. (*The Boston Med. and Surg. Journ.*, Jan. 16, 1879.)

Treatment of Strychnia Poisoning.—Rivine, in a case of strychnia poisoning in a girl of 16, has found that 40 grains of potassium bromide, and 10·20 grains of chloral hydrate were of great use, whilst 120 grains of potassium bromide or 40 grains of hydrate of chloral are necessary by themselves. He therefore recommends the combination of the two remedies in the treatment of cases of poisoning by strychnia. To test this theory, his pupil, Hessler, has carried out certain experiments on rabbits. For this purpose Hessler has investigated the mode of action of potassium bromide on the sleep produced by chloral hydrate. He finds that the simultaneous administration of the former drug does not appreciably prolong this sleep. That sensation and reflex irritability are never completely abolished. That the danger of a fatal termination would not be diminished in narcosis produced by the administration of $\frac{4}{5}$ths of the minimum lethal dose of chloral hydrate with the addition of potassium bromide in a small dose (about $\frac{1}{3}$ of the lethal amount). In ten cases of the minimal lethal doses of strychnia the method advocated by Rivine was not of more use than the simple chloral treatment; by both methods the tetanus which threatened life was allayed, and consequently life was prolonged. The duration and intensity of the attack was lessened to the greatest extent when the chloral mixture was given. When the minimal lethal dose of chloral hydrate was not exceeded, a sudden diminution in the frequency of respiration and death from chloral poisoning occasionally occurred. The ultimate conclusion to which the experiments have led is that the simple treatment of acute strychnia poisoning by means of chloral hydrate is decidedly superior to the combined method proposed by Rivine. (*Centralblatt f. die med. Wiss.*, Jan. 25, 1879.)

The Excretion of Iron.—Hamburger has lately found by experiments upon dogs that under several conditions the amount of iron which leaves the body in the urine and fæces is almost identical with that given with the food, provided this quantity be comparatively small (150 to 176·5 milligrams in thirteen days), but that if iron be given in excess (600 and 800 milligrams during the same period) a small portion (22–27 milligrams in the above experiments) is retained in the system. This fact need not, however, surprise us, when we consider that iron is a constituent of various organs and secretions of the body. The interesting point is that iron is excreted, not by the urine, but by the bowels. Thus of 608·4 milligrams excreted in thirteen days only 12 milligrams passed out by the urine. Moreover, it appears that excess of iron in the urine is not excreted merely as an iron salt, but in the form of an organic body containing iron, for the metal cannot be detected by the ordinary tests, such as ammonium sulphide. Hamburger believes that the iron in the fæces is partly excreted by the mucous surface of the bowel. Part, no doubt we may add, is merely the unabsorbed salt converted into sulphide, but a good deal is certainly derived from the bile, and primarily from decomposed hæmatin, as well as from the decomposed pancreatic juice. It is important to keep in mind the fact of the very large excretion of iron in the bile, which Nothnagel estimates at 0·0408 gram per diem for an adult man, for forgetfulness or ignorance of it has led some persons to deny that any material amount is absorbed at all by the stomach and intestine. (*The Med. Times and Gaz.*, March 22, 1879.)

Sodium Benzoate in Puerperal Fever.—Dr. Petersen says that he is unacquainted with any published case in which sodium benzoate has been found beneficial in puerperal fever. He therefore puts the following on record. A primipara aged 25 was attacked with puerperal fever twelve days after labour. There was parametritis particularly upon the right side, and at the fundus, accompanied by great pain and meteorismus. Diarrhœa was also present, the pulse was 140-150, the temperature 40°. After the administration of 15·0 sodium salicylate, the temperature fell to 38·8°, collapse threatened, dyspnœa was well marked, and the meteorismus increased. After the frequent and liberal administration of wine and strong beer the pulse improved and ½ per cent. solution of quinine was ordered to be given every two hours, and as this caused considerable singing in the ears, 7·5 grams of sodium salicylate were to be given in two evening doses. By an oversight only one gram was administered, however, when the temperature again rose to 40°, although the pulse was not slowed. Five grams of sodium salicylate were now given in a single dose; next morning there was again threatened collapse, which was warded off by wine. Sodium benzoate was then prescribed, a teaspoonful of a solution containing 10 : 20 hourly, since, according to Schüller, this drug is useful in every kind of septic infection. The dyspnœa disappeared, and the general condition of the patient underwent a marked improvement. The meteorismus had decreased in three days, probably in consequence of the rubbing in of 30 ungt. ciner., but apparently as a consequence of the sodium benzoate. After a repetition of the dose of sodium benzoate the temperature fell to 39·5°, but the pulse was 120; the patient slept. It was also noticed that previous to the use of the sodium benzoate there were injuries on the lips and tongue as well as bed sores. These complications improved under the use of the drug alone, and were completely cured by the continued use of this substance, continued with a borax lotion and ungt. plumbi. The dose of sodium benzoate was increased to 15·20, when the temperature was reduced to 38·5°, the pulse being at 104, and the condition of the patient improved. Dr. Petersen recommends the benzoate of soda as a drug which requires further consideration in regard to its effects in cases of puerperal disease. (*Centralblatt für die medicinischen Wissenschaften*, March 8, 1879.)

Notes and Queries.

THYMOL SOAP.—We have received from Messrs. Richardson and Co. a specimen of antiseptic soap prepared with thymol instead of carbolic acid. In antiseptic power thymol is said greatly to surpass carbolic acid, and its odour is very pleasant instead of being disagreeable. It is sometimes said of hospital patients that they like their medicine to be nasty, as they think it does them more good ; and this objection does apply to thymol soap, that it is very much pleasanter to use, and may therefore be regarded by some as less efficacious than carbolic acid soap. Theoretically it ought to be quite as effective ; it is very agreeable, and it is an excellent detergent.

ABSORBENT COTTON WOOL.—This cotton wool is so prepared that it takes up fluid more freely than a sponge, and is therefore much better adapted as a dressing for wounds than the ordinary cotton wool. It is also an excellent styptic, quickly staunching blood when applied to a cut.

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Department of Public Health.

A CHAPTER FROM THE SANITARY HISTORY OF THE RECENT RUSSO-TURKISH WAR.[1]

No episode of the war between Russia and Turkey, which has recently come to a close, presented more deplorable features than the flight of great masses of the Roumelian population before the advancing Russian forces after the passage of the Balkans, and none excited a more lively sympathy in this country. Whole communities—men, women, and children—deserted their homes in the later weeks of a tempestuous autumn and the early weeks of a severe winter, the greater number ill-provided with the means of subsistence even for a few days, and often imperfectly clad either against wet or cold. Falling back from town to town towards Constantinople and the sea-coast, at each step the miseries and sufferings of the fugitives increased until they reached a pitch which the official reporters for the Ottoman Government have not hesitated to say was "unique," even as contrasted with all the horrible episodes recorded in history of the same sort.

From the time of the Russian forces crossing the Danube an "emigration" (as it is euphemistically called in the official report) began from the threatened districts in Bulgaria to the Bosphorus, which increased in proportion as the invaders advanced into the interior. But this emigration did not attain any considerable magnitude until the Balkans had been passed and the Russians had descended into Roumelia. Then a veritable panic seized upon the populations of the districts in the tract of the advancing enemy, and the flight from all but the larger towns appears to have been well-nigh general. The greater number of the fugitives directed their course first to Adrianople, which is connected with Constantinople by railway, in the hope of readily escaping to the Bosphorus. Readers will remember the state of this town at this time, and of its approaches for many miles, as described by the special correspondents of the daily papers. The winter had set in with severity; the weather was tempestuous; the winds icy cold; and rain alternated with snow. The roads had been beaten into quagmires by the movements of troops and the materials of war, and the level country was a morass. Impelled by fear, without shelter, with the scantiest food, and at times almost without clothing, the fugitives struggled through the dreadful difficulties which interposed between them and their assumed haven of safety, leaving lamentable relics of the terrible contest profusely scattered on their route. Flocking into Adrianople they crowded into every available space, until streets, open places, and especially the vicinity of the railway station, became a seething mass of agonised humanity.

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[1] *Les Réfugiés de la Rommanie en* 1878.—Rapport présenté au Conseil International de Santé par les docteurs Mordtmann, Gabuzzi, et Stécouli, Inspecteurs spécialement Chargés du Service de l'Emigration.

When the news of this terrible state of things reached Constantinople and it was understood that every hour brought with it an augmentation of miseries to the fugitives—excepting only those, especially children and young, who happily escaped by death—the heart of the capital was profoundly moved. Notwithstanding the impending military and political crisis, even the official world was not less profoundly touched than the general world, and every section of society, foreign and other, prepared to deal as best might be with the gigantic and imperfectly foreseen flood of misery which was about to be poured into the capital. The Sultan, the ambassadors of foreign powers, the volunteer organisations sent to help at the seat of war, the heads of the religious communities, all claimed their part in the work, and Constantinople never saw a more remarkable assemblage of people, ladies and gentlemen, than that which waited at the railway station for the train which was announced to bring the first detachment of fugitives from Adrianople. On a day of December, when heavy rain contended with heavy snow, and a boisterous wind with both, the looked-for train slowly drew up at the platform, the actual state of its freight, for the moment, hidden beneath a covering of snow. For a moment—for a moment only—the deceitful pall screening the inexpressible horrors beneath—there was a hope that rumour had magnified the sufferings of the fugitives. The eye quickly belied the hope, and it was seen that the roofs of the carriages, the tender, the buffers, every point to which a human being could cling, was occupied by people stupefied by cold and the want of food, many frost-bitten, many more ill, not a few dying, others already dead. How many had dropped from these exposed positions on the way will never be known. Then each carriage from within disgorged, with difficulty, its freight, disclosing in the process every form of suffering from exposure, from cold, and from hunger, as well as the corpses of those who had died on the journey—some from exhaustion, some, apparently, from suffocation in the densely packed vehicles. Happily the aid was abundant and ready; plentiful warm food was waiting for infants and young children, as well as for adults, large stores of warm clothing had been got together, and every available shelter in and about the railway station had its fire and other means for giving warmth. As the fugitives recovered some degree of power after their sufferings, they were rapidly drafted off to the khans and other places provided for their reception.

But each succeeding train for many days brought its freight of fugitives, and each met with the same reception. To the fugitives from the districts beyond Constantinople now came to be added the fugitives from the districts intervening between Adrianople and the Bosphorus, until at last the number became so large that some of the principal mosques and several of the Sultan's palaces had to be converted into reception places for them, and every available building on both sides of the Bosphorus given up for their use. At one time there were not less than 120,000 fugitives sheltered in the mosques, empty houses, khans, and schools of Stambul alone.

The total number of fugitives from Roumelia which fled towards the coast on the advance of the Russian troops is estimated approximately at 500,000. Of these 300,000 fled by way of the capital, 50,000 by Rodosto, 50,000 by Dédéagatah, and 100,000 by Varna, Bourgas, and Baldgik. Of this great number of fugitives it is estimated that 50,000 only completed their flight at their own cost, and of these 20,000 proceeded directly from the port of Rodosto into Asia Minor. Of the remainder, 75,000 were still sheltered in Constantinople at the beginning of this year (1879); 200,000 had been distributed at the cost of the Ottoman Government in the various provinces of the empire, especially the Asiatic provinces; 25,000 only returned to their own homes; and it is believed that not less than 150,000—more than one-third of the whole number—died.

The medico-sanitary history of the fugitives who fled to Constantinople, as given in the report noted at the commencement of this article, is full of interest.

The flood of these victims of the war pouring into the capital quickly surpassed the means which were available for its due regulation. It soon became impracticable to do other than provide shelter (irrespective of the conditions under which the sheltered lived) and the barest requisites of life. In other words, until the rush of fugitives began to abate somewhat, the primary matters of shelter and feeding alone admitted of being dealt with. The means of shelter quickly proved insufficient for the multitude, and they became overcrowded to an indescribable extent. Twelve thousand were packed within a short interval in the mosque of St. Sophia and its precincts; 4,000 were huddled together in the mosque of Sultan Achmet, 5,000 in the mosque of Yéni Djami, and so on, in proportion, of other mosques, and of the palaces, schools, khans, &c., where the fugitives were distributed. At the best, many of the buildings used are so constructed as to admit of little light and change of air. During a rigorous winter, with no method of artificial heating which could be used except brasiers of incandescent charcoal, and when the vital functions of the half-starved (too often wholly starved) fugitives presented but the feeblest resistance to cold, warmth could alone be maintained by the huddling together of the sufferers, and the exclusion as far as possible of every breath of outer air. There were at first no means for the preservation and maintenance of cleanliness; and even had these existed, the great proportion of helpless beings whose necessities could not well have been met except in the wards of a well-administered hospital would largely have frustrated their use. The interiors of the buildings occupied by the pilgrims presently passed into a state too shocking to be described in detail. The floors and passages of some of the mosques were literally flooded with excremental and other filth; the atmosphere became mephitic with the effluvia from the bodies and breathing of the fugitives, and from the unimagined filth in which they lived; and the walls to the roofs were covered with a thick layer of stinking deposit carried up from the steaming Malebolge below. Even outside matters were little better than within, as the courtyards were too commonly sloughs of the most disgusting filth.

Now at the time when this great inrush of fugitives took place, and while the conditions under which they had been sheltered were becoming such as above indicated, the health of Constantinople did not differ from what was commonly observed in the winter months when no epidemic disease came to disturb the usual state of things. Excepting respiratory diseases, senile and infantile diarrhœa, and a few cases of enteric fever, there was nothing to call for special observation in the state of health of the civil population. Small-pox was not noted, and typhus is not known to have existed. In the midst of the population of Stambul thus enjoying its customary health was installed, in localities scattered pretty generally over the whole area of the city and on the opposite side of the Bosphorus in Scutari, the mass of fugitives under the conditions described. In Constantinople also were accumulated many thousand sick and wounded from the seat of war. Here also had to be found in the already crowded cemeteries room for the multitude of dead which soon in a thickening stream claimed a resting-place.

When the conditions surrounding the fugitives became such as have been described, much anxiety was aroused respecting the probable consequences to their health, but it was found difficult at first to get accurate information as to this, partly from the inability of the medical staff employed, by reason of its smallness, to cope with the gigantic task which had suddenly come upon it, and partly by reason of the difficulties arising from the horribly repulsive state into which the fugitives had fallen.

But before long small-pox broke out amidst them, and shortly after this disease was followed by typhus, both maladies during their prevalence claiming the almost undivided attention of the medico-sanitary authorities.

It seems probable that small-pox was among the fugitives when they entered Constantinople, and under the favourable conditions for its spread which were unavoidably soon created there it extended rapidly. It spared neither age nor sex, but infants chiefly suffered. The form was "discrete," the hæmorrhagic form being rarely observed; and the disease did not exhibit the usual characters of malignancy, nevertheless 50 per cent. of the attacked died. The number of cases which occurred is not known, but it is stated approximately at 10 per cent. of the fugitives. Vaccination was had recourse to widely, special hospitals were created, and later the foci of infection were broken up, and the persons sheltered there scattered. The disease ceased at the beginning of May.

Typhus broke out in the latter half of February, the second month of the flight into Constantinople. The disease first showed itself in the mosque of Saint Sophia, and presently it was observed in the other places where fugitives were sheltered. The disease spread among the fugitives with frightful rapidity. The hospitals provided could only receive a fraction of the sick. These were simply innumerable, and the mortality was dreadful during the months of March and April. The fugitives seemed literally to melt away under the influence of the malady. *Half* the occupants of some of the mosques, khans, and schools actually succumbed to it. During the two months referred to, 7,000 fugitives had been received into Saint Sophia; at the end of that time but 3,000 were accounted for as living. Of 650 lodged in the school of Ak-Seraï but 250 survived.

The mortality from the disease reached 60 per cent. of the attacks. Towards the end of April typhus began to lose its gravity, and at the end of June it disappeared.

The arrest of the disease, as well as of small-pox, seemed chiefly to depend upon the energetic measures taken by the General Board of Health to clear out the overcrowded mosques, khans, &c., and to distribute the fugitives in the suburbs of the city under more wholesome conditions. The state of overcrowding and filth into which the fugitives fell soon after reaching Constantinople lasted about four months, and it is a moot question whether the typhus was developed as a result of these conditions, or whether it had been imported from the Russian or Turkish armies, in both of which the disease existed at the time. Many of the fugitives had come from within the lines of both forces.

The efforts made by the Ottoman Government, and by the several voluntary agencies which came into play at the moment, to make headway against this sudden flooding of Constantinople with an unwieldy mass of helpless suffering, form the one bright feature of this horrible episode of the war. Much as the efforts fell short—and necessarily so, it must be admitted—of the requirements of the case, they were nobly conceived, carried out to the fullest extent the resources admitted of, and were effectual as far as they were accomplished. Hospital accommodation to the extent of 2,430 beds had been provided—1,400 by the Ottoman authorities, 790 by a voluntary International Commission established in Constantinople in January 1878, and 240 by the Turkish Compassionate Fund instituted by the Baroness Burdett Coutts and promoted by the *Daily Telegraph.* Other voluntary associations were formed and gave effective aid in various ways, and the Red Cross Society stepped outside its proper functions with the sick and wounded to help. The official report tenders the warmest thanks to all who gave aid by money, material and personal help; and especially it signals out for thanks the English ambassador, Sir H. Layard and Lady Layard.

Apart from the particular interest attaching to the episode briefly recorded above in its relation to the medico-sanitary events of the war, there is a special interest which belongs to it in its relation to Constantinople. During the four months (January to April) when the city had these numerous foci of infection both of small-pox and typhus in its midst, how fared the civil population in regard to the two diseases? It has already been stated that at the beginning of the flight from Roumelia, Constantinople had its accustomed health, and was free from small-pox and typhus. *At the close of the episode the civil population, except such portions of it as were brought into immediate contact with the fugitives and with the Russians, then before the city, were still free.* In other words, no general infection of the city occurred either from small-pox or from typhus during the whole of this terrible episode, and instances of infection were observed only among the persons who were brought into direct relations with the fugitives. Thus in respect to typhus the medical men, particularly the medical students, and the nurses and other attendants, were disabled one after another by the disease, so as to make it at times most difficult to render any help whatever. This is not the first time that the civil population of Constantinople has escaped any general diffusion of typhus when it has had numerous formidable foci of the disease in its midst. Precisely the same phenomenon wa observed during the Crimean war, when the French hospitals in Constantinople were overladen with the disease, yet the city escaped. It is not pretended that any particular care was taken to prevent dissemination of infection from the hospitals at that time; neither is it pretended that any particular care was (indeed could be) exercised to prevent dissemination of the infection from the fugitives last year. Both cases bring out in the most curious and instructive light how slight a measure of isolation is often sufficient to render abortive seemingly formidable centres of infection. The general isolation of the French hospitals during the Crimean war and of the infected bodies of fugitives during the Roumelian flight of last year—an isolation wholly unpremeditated in a sanitary sense—was sufficient to save the surrounding population from the infection of typhus. The immunity from small-pox was aided by vaccination, but even here a considerable part of the safety seems to have arisen from the same cause as the immunity from typhus.

This episode of the Roumelian flight and of the medico-sanitary history of the fugitives in Constantinople is peculiarly valuable as an illustration of the conditions which influence the dissemination of infectious diseases, and particularly of the conditions which limit such spread.

ENTERIC FEVER: A CRUCIAL INSTANCE OF ITS SPREAD THROUGH THE MEDIUM OF DRINKING WATER.

Dr. Thorne Thorne's Report to the Local Government Board on the extensive epidemic of enteric fever which lately occurred in and near the towns of Caterham and Redhill, is one of special interest; for not only was the disease brought about under conditions which we believe to stand alone in the history of such epidemics, but the various stages of the inquiry as detailed in the report exhibit in a perspicuous and intelligible manner the method of inquiry which is usually adopted by the Medical Inspectors of the Board, and which has hitherto been attended with results which leave little to be desired.

Early in February last the Local Government Board received information as to the sudden occurrence of a group of enteric fever cases in Caterham, and from information then at the disposal of the Board, it would appear that there were even at this early stage grounds for believing that the cause might be one which would operate over an extensive district, including several sanitary areas having different Officers of Health, and hence probably the prompt intervention of the Central Authority who alone could, by the aid of one of their inspectors, comprehend in one inquiry all the circumstances of the several districts.

In the fortnight ending February 2nd, as many as forty-seven cases of enteric fever had occurred in the little town of Caterham, which had long been free from even isolated cases of the disease, and this group of cases was at once made the subject of investigation. On this point the report states :—

> "The cases of enteric fever referred to were spread over a very wide area, some in Upper, some in Lower Caterham, extending to the extreme outskirts of those places. The houses attacked belonged to no special class, both rich and poor having suffered. It was at once apparent that the disease could not have been conveyed to the affected houses by means of any general system of sewers common to the district, for by far the majority of the houses were found to drain into separate cesspools excavated into the chalk; some of these cesspools, as also the house drains, being efficiently ventilated, others having no such ventilation. Some of the houses affected had no artificial means of drainage, the liquid refuse

being thrown on to gardens adjoining them. There was also no possibility that there had been any common cause of infection in connexion with the prevailing means of excrement disposal, because there was nothing in common with regard to such disposal." . . . "The possibility of infection having been communicated by means of a milk-supply was next inquired into, and it was ascertained that thirty-three of the houses affected received their milk from at least five different and completely independent dairies, and that at the remaining two private cows were kept. It was also evident that personal infection could not in any way have led to the outbreak."

"With regard to the water-supply, it was ascertained that out of a total cf 558 houses in Caterham, 419 were provided with water from the mains of the Caterham Waterworks Company, the remaining 139 deriving their supply from local wells or from rain-water-tanks and barrels. Of the forty-seven persons attacked during the fortnight January 19th—February 2nd, forty-five resided in houses where the water of the Caterham Waterworks Company was in use, a circumstance which, having regard to the other points already adverted to, indicated a likelihood that this water had been the means by which the infection had been conveyed, and this view received confirmation when it was further ascertained that the two remaining patients, who resided on premises where private wells were in use, had, owing to the nature of their employment, not only been in the habit of spending the day at houses to which the Company's water was laid on, but had admittedly used this water."

It was further ascertained that amongst 2,000 inmates of the Caterham Asylum, and amongst 500 men at the Caterham Barracks, both of which establishments have an independent water-service, no cases had occurred.

In the meantime the same disease was ascertained to be prevailing in Redhill, and Mr. Jacob, the Medical Officer of Health for the combined Surrey sanitary districts, who had commenced an inquiry into the circumstances of the outbreak, from this period continued it in conjunction with Dr. Thorne. According to the Report, Redhill has a population of about 9,500; it

"is situated about eight miles by road from Caterham, and it differs from that place in several material respects. It lies on a different geological formation, namely, on the lower green sand; it is nearly throughout provided with a modern system of sewers, which is believed to be efficiently constructed and efficiently ventilated, and many of the drains connecting the houses with the sewers are also ventilated. But, in regard to the epidemic of enteric fever, the two places presented certain remarkable points of similarity. In both the epidemic had commenced at about the same time. In Red Hill, the first two attacks were reported to have occurred on January 20th; these were followed by three others on the 21st, five more on the 22nd, twelve on the 23rd, and at the expiration of the first fortnight, viz., by February 2nd, fresh attacks in fresh houses had every day occurred until the total number of houses affected was ninety-six, and the number of patients had reached 132. The sewers, it is true, were common to the greater part of the district affected, but in this respect there were some striking exceptions, to which reference will be made, and so far as prior cases were concerned from which the infection could have been communicated by means of the sewers, there was evidence to the effect that Red Hill had been for at least eighteen months past quite free from the disease. The milk-supply of the houses affected was also ascertained by Mr. Jacob to have been derived from many sources having nothing in common, either amongst themselves or with the Caterham dairies. The water-supply for the greater part of Redhill is, like that for Caterham, derived from the works of the Caterham Waterworks Company, and I found that, as the result of an early investigation of the epidemic, Mr. Jacob had, quite independently of myself, arrived at the conclusion that the spread of the disease was in all probability due to this water. Red Hill contains about 1,700 houses, and of these 924 had the Company's water laid on to them. Of the ninety-six houses affected during the first fortnight of the epidemic ninety-one habitually drew their water from the Company's mains, and the histories obtained, with reference to the attacks in the remaining five, were such as to confirm the impression that the Caterham Company's water had been the immediate cause of the epidemic.

"Thus, at one of these houses, where ultimately three persons were attacked, the supply had, it was hitherto believed, been exclusively derived from a rain-water tank, but it was now ascertained that the Company's water was, in addition, procured surreptitiously; at another, for which there was apparently no water-supply, the Company's water was procured from a neighbour; and with regard to the remainder, the patients affected were not only persons who were employed where the Company's water was in use, but several of them had partaken of the water at their meals."

Further details are then given to show that the entire western ward of the borough of Redhill, which had a different water-supply, besides numerous special groups of houses deriving their supply from local wells, entirely escaped from the disease; whereas outlying places such as the Earlswood Asylum, having the Caterham Company's water, were attacked in a similar manner to the towns of Caterham and Redhill. Thus all the facts ascertained in connection with this epidemic up to the end of the first fortnight afforded very strong presumption that it had been caused by the use of the Caterham Company's water.

This view, however, received no support either from consideration of the source whence this water is derived, namely, the chalk wells, more than 500 feet deep, sunk at the southern extremity of the high-lying ground which bounds the Caterham valley on the west, nor from the history which had attached to its previous use, and which, in point of wholesomeness, had won for it a deservedly high reputation. But the speedily accumulating evidence which associated the spread of the epidemic with the consumption of this water was so great that everything relating to its sources, storage, and distribution was carefully inquired into. All these points are fully discussed in the Report, but nothing was ascertained which could in any way account for the epidemic. The dangers attaching to intermitting water-services could not have come into operation, for there had been no intermissions; no accidental contaminations could have occurred during a period antecedent to the epidemic in which supplemental supplies of water had, owing to a temporary emergency, been procured from a deep well at the Caterham Asylum and from one belonging to the Kenley urban sanitary district; and although facts were ascertained which amply suffice to support the complaints which have from time to time been made as regards the practice of fouling the chalk in various parts of the Caterham Valley with cesspool soakage, yet no such soakage could under the circumstances detailed have brought about this epidemic.

By this time every known method by which the water from deep wells could become polluted, either at its source or in course of transmission through the mains, had been exhausted.

Circumstances had, however, in the meantime come to Dr. Thorne's notice which led to the inquiry with reference to any possible contamination of this water-supply being extended in another direction.

On this point Dr. Thorne proceeds:—

"During the latter part of 1878 and the beginning of 1879 the Caterham Waterworks Company constructed an adit from one of their old wells up to a new bore which was then being sunk. This adit is situated in the chalk at a depth of 455 feet; it measures 6 feet by 4 feet, and is 90 feet in length. A number of men were employed in this work, some of them being in the well below, others on the surface.

"Inquiry was made as to whether any of these men had ailed whilst at their work, and it was ascertained that one of them who left work some time in January was believed to have been ill, although no inquiries had been made concerning him since he quitted the works. This man I sought out, Mr. Jacob accompanying me on the occasion. At first his wife only could be found, but subsequently an interview was had with the man himself, and from the statement of the two the following history was obtained:—

"J. K., aged 32 years, the man in question, resides in Caterham, and he entered the service of the Caterham Waterworks Company on October 25th, 1878, being employed as a labourer in the construction of the new adit referred to. The position assigned to him was that of 'loading man,' he being employed in the adit below in attaching to a rope, let down from above, the buckets by which the excavated chalk was raised to the surface, and in again receiving those buckets when lowered full of bricks and cement, required for the work in progress. Owing to a temporary inability of the pumps to keep down the water below the level of the adit, work was discontinued on December 14th, when J. K. was discharged, and it was not until December 29th that he was again sent for to resume the place he had formerly occupied. When he returned he was in perfect health, but, 'in about a week,' *i.e.* about January 5th, 1879, he felt himself ailing. His symptoms, which, according to his statement, steadily increased, were at first loss of appetite, recurring attacks of shivering alternating with a feeling of heat, great pains in the limbs, which he attributed to rheumatism, but which instead of being confined to any of the joints, were described both by himself and his wife, as an 'aching all over,' and diarrhœa. As the symptoms became aggravated, he was so exhausted during his work, and became so 'giddified,' that he was more than once drawn to the surface, and immediately on his return home he was compelled to go to bed. More than once his wife noticed that he was 'light-headed' in his sleep. All this while the diarrhœa continued, the man making a great effort to remain at his work, because, as he explained, he had had no employment between the 14th and 29th of the previous month.

"With reference to this man's diarrhœa it is necessary to make the following explanation :—Both from his own statement, and from that of others, it appears that all the men who worked in the adit were expected to make such preparation before descending the well, that no occasion should exist for relieving themselves below ; but should such necessity ever arise, and should there be at such a time any difficulty or delay in their being drawn to the surface, the buckets, which were regularly being raised to the surface, were to be used for that purpose. J. K. states that he strictly complied with these regulations before descending, but that notwithstanding all his efforts, the purging under which he was labouring was such that he was compelled to evacuate whilst in the adit 'at least two or three times' during each shift, the shifts lasting apparently from eight to twelve hours each according to circumstances. Indeed, as time went on, the man's diarrhœa must have been considerable, for besides the attacks which came on whilst in the adit, he almost invariably suffered from it, before descending, immediately after ascending, and also at his own house. So matters continued until January 20th, when work was again suspended for two days on account of a rise in the water level. But during the night of the 21st he was so much worse that he was unable to rise next morning. According to his wife's statement he found he could not stand when he got up, and returning to his bed suffered from 'shivering down the back,' 'aching and exhaustion,' and later on severe abdominal pain came on, which compelled him to lie with his knees drawn up : he was also 'burning hot.' This pain was looked upon as 'cramp,' and was alleviated by linseed-meal poultices which were applied by his wife. The more severe symptoms, including the diarrhœa, having subsided, he was two days afterwards able to get up for a while, and from this time convalescence appears to have set in. No medical advice was sought, mainly, as he explained to me, owing to his straitened circumstances. When I saw him, on February the 8th, he had the aspect of a man who had recently suffered from some acute disease ; he was still very weak and it was obvious that he had greatly lost flesh.

"As the successive points in this history were learned, more and more resemblance appeared to a mild case of enteric fever, until, after the whole of the above story had been learned and after the man himself had been seen, the diagnosis of this fever could be made with a considerable degree of certainty. Then inquiry as to the man's movements at the period when the cause of his own fever must have been operative, brought out the fact that he had spent December 25th and 26th at Croydon, and it was there ascertained that he had had opportunity beyond what Caterham then afforded for getting the fever."

The Report then proceeds to explain that if

> "this man's stools could by any means have found their way into the water of the well in which he had been working, and being enteric fever stools could thus have led to the development of the poison of that disease in the well, the effect on the water consumers ought to have been noticed within from about ten to fourteen days after the date when the diarrhœa first came on. And this, in effect, is precisely what did take place, the epidemic having commenced on January 19th and 20th in Caterham and Red Hill respectively. This remarkable concurrence of dates led to a more detailed inquiry as to the course of the man's diarrhœa whilst working in the adit. He admitted that the purging was very copious, in short that it 'ran from' him; indeed, when at home, he was, because of the suddenness of its onset, unable to resort to the closet. He further admitted that owing to his frequent use of the bucket whilst at work, complaints were made by his fellow workmen on the surface; and although he stoutly denied that he had ever been so pressed by necessity, or so influenced by those complaints, as to relieve himself in the adit without waiting for a bucket, there were undoubted means, as explained in the Report, by which his evacuations could have found their way into the water."

All these circumstances are then summed up as follows:—

> "Here then were the stools of an enteric-fever patient, from about January 5th onwards, getting into the Caterham Company's water and distributed with that water to the district served by the Company.
>
> "Now we know from ample experience that enteric fever is produced, and produced with the maximum of certainty, when the specific evacuations of that disease are consumed by a population. Again, it is a matter of experience that where enteric fever has been conveyed through water, some fortnight has to elapse between the distribution of the water and the occurrence of the disease among the community served by it. But a fortnight after January 5th is the very day when the first case of fever occurred, and during the fortnight following upon the period January 5th to 20th, *i.e.*, from January 19th to February 3rd, the disease became widely spread throughout Caterham and Red Hill; the distribution of the fever being limited, as we have already seen, to houses supplied with the water of the Caterham Company. There can, I think, be no doubt but that we have in the man J. K. the cause of the disease which followed."

This point being reached, the progress of the epidemic beyond the first fortnight is entered into in detail, and it is further shown that cases of the same disease occurred in other villages where a few houses receive the same water-supply. The total number of cases reached about 370 and the deaths numbered twenty-one.

There is, however, one village, namely, Warlingham, where the Caterham water is laid on to as many as 156 houses, and yet this village remained throughout exempt from the epidemic. This immunity appeared at first view difficult of explanation, and the manner in which the question is completely solved is so interesting that we prefer here again to quote Dr. Thorne's words in full. After explaining that at the Caterham and Redhill rate some twelve houses at least in Warlingham should have been attacked, Dr. Thorne asks the question, Why did Warlingham escape?

"In proceeding to consider the answer to this question, let the special situation of Warlingham, in regard to its water mains, be first observed. The village of Warlingham lies about three miles from the Caterham Water Company's works, and for the greater part of that distance it has a special three-inch main to itself and to a few houses between Caterham and Warlingham. The capacity of this main and of its branches is somewhat over 12,200 gallons. What if this main can have been charged with a different water and not with the water from the Caterham Company's wells?

"Now, in a former part of this Report, I have told of the Kenley water being used to supplement the Caterham Water Company's supply, during certain portions of the time when the Caterham wells were, for reasons named, furnishing a diminished and—as the result showed—an injurious supply. The Kenley water was, however, not mixed equably with the Caterham water. It was pumped into the Caterham Company's mains at one particular point. *And that point was at the extreme further end of the Warlingham branch of the system.* Before the Kenley water could get to the Caterham Company's reservoirs, it had to fill the whole of the three-inch Warlingham main and its branches, besides one other larger main near to Caterham. Every night an amount of Kenley water, which is variously estimated, but which at the lowest estimate averaged between 13,000 and 14,000 gallons, was pumped into this Warlingham system towards Caterham, and every day some 12,000 gallons of this Kenley water would have to be consumed at Warlingham before Warlingham could obtain a drop of water derived from the wells at Caterham. While this was going on there was for each house at Warlingham a supply of some 70 gallons and more of Kenley water to be got rid of before any of the Caterham water could be procured.

"It is true that on particular nights, and those during the time that the Caterham well water had dangerous properties, this pumping of Kenley water was not going on. From January 11th to January 14th, more or less of Caterham water must have found its way in the direction of Warlingham. Whether it actually got there before it was met and driven back again by the Kenley supply, which on the 14th was again introduced into the end of the Warlingham main, or whether the Kenley water pumped in before the 11th was all that the village ever received during that interval, is more than can be decided with any degree of certainty.

"For my own part I am quite prepared to believe the latter of these alternatives, the more so as I ascertained that the consumption of water in Warlingham was, at the special period referred to, as also during the greater part of January, at its minimum. For, owing to the exposed position of the service-pipes and taps, and to the hard frosts which then prevailed, hardly any water at all had in several parts of the village been obtained from the mains for several days; the inhabitants resorting to rain-water, which is largely stored in the village. And even when the Company's supply was procurable it was, owing to the same cause, a mere 'dribble.'[1] This, however, is abundantly clear: the delivery of the harmless Kenley water to the village of Warlingham was so special and was continued during so large a part of the time when other places were being injuriously affected by the Caterham water, that the chances of suffering from any injurious influence carried by the latter water must have been out of all proportion less in the case of Warlingham than in the case of places that got the bulk of their supply from the Caterham wells."

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[1] The mean temperature on the grass as registered by Dr. Adam at the Caterham Asylum from January 8th to January 31st inclusive was 21·6° Fahr., it

"Rightly looked at, I judge that the almost complete, if not the complete, exemption of Warlingham, is a very considerable confirmation of the view I have expressed with regard to the origin of this epidemic."

Space forbids our entering into the details of the remedial measures adopted by the sanitary authorities and by the Water Company at Dr. Thorne's suggestion. They were, however, fully carried out, and recent information as to the subsidence of the epidemic has shown that they were completely successful.

Perhaps one of the most useful results which has attended this remarkable outbreak is the discussion which it gave rise to at the recent Conference on National Water-supply held under the auspices of the Society of Arts at the special request of H.R.H. the Prince of Wales. At this Conference the subject was discussed at considerable length, and the following suggestions, which Dr. Thorne laid before the Conference, as combining the principal lessons to be learnt from it, were embodied in a resolution which received the unanimous support of the Conference :—

"1. That the view, to the effect that even a comparatively minute quantity of the poison contained in the evacuations of enteric fever patients may, when subjected to conditions favourable to the development of that poison, lead to the specific infection of very large volumes of water to which it has gained access, is fully borne out.

"2. That a special danger attaches to the mild—or as they have been termed 'perambulatory'—cases of enteric fever, by reason of the intensely poisonous nature of the diarrhœa which characterises that disease.

"And having regard to these facts :—

"3. That all possible sources of excremental contamination, in the vicinity of water sources, should be rigidly dealt with.

"4. That care should be taken, in connexion with works for the construction or storage of water, to exclude from employment all persons suffering from any diarrhœal affection."

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having varied from 12·0° Fahr. on the 11th to 31·5° Fahr. on the 15th ; and the experience both at the Caterham Asylum and at the Guards Barracks is to the effect that during the late severe weather in January last the consumption of water was reduced nearly one half.

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